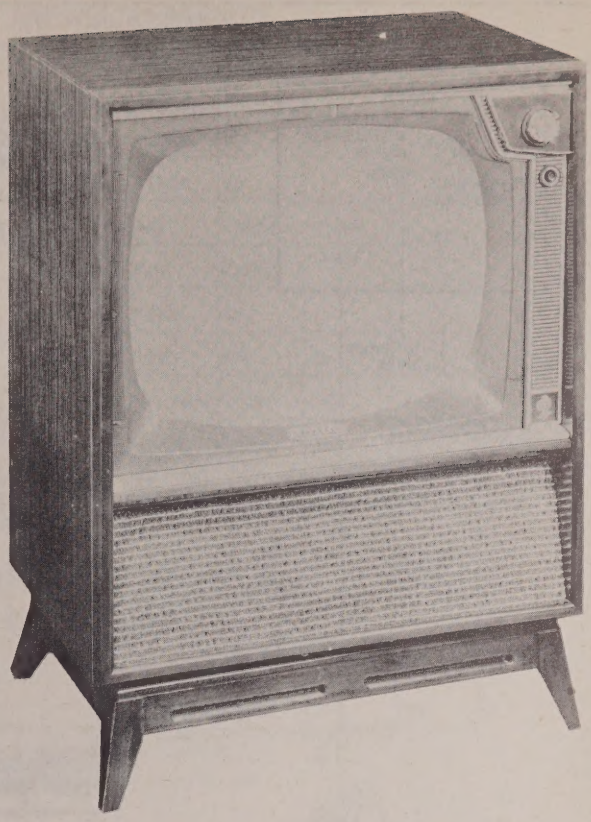
PHOTOFACT* Folder

*TRADE MARK

CORONADO MODELS TV2-9465A, TV2-9466A, TV2-9470A, TV2-9471A, TV2-9475A, TV2-9476A, TV2-9480A, TV2-9481A

DISASSEMBLY INSTRUCTIONS



CHASSIS REMOVAL

1. Remove 4 push-on type knobs from the front. Remove 2 wood screws holding the knob escutcheon. Remove the escutcheon and 4 remaining knobs.
2. Remove 6 wood screws from the rear cover. Remove the rear cover.
3. Loosen 2 wood screws and remove the antenna terminal board.
4. Remove 2 wood screws from the top chassis braces.
5. Remove 4 chassis bolts from the bottom.
6. Remove the speaker leads.
7. Remove the chassis.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

Care should be exercised when connecting test equipment or physically contacting the chassis.

TRADE NAME	Coronado	MODELS TV2-9465A, TV2-9466A, TV2-9470A, TV2-9471A, TV2-9475A, TV2-9476A, TV2-9480A, TV2-9481A
SUPPLIER	Gamble-Skogmo, Inc., 15 North 8th. Street, Minneapolis, Minn.	
TYPE SET	Television Receiver	
TUBES	Fifteen	
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 1.3 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)	

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 5 wood screws from the trim at the top edge of the safety glass. Tilt glass out at the top and lift up to remove.

SPECIAL ADJUSTMENTS

A. Range
Turn range control fully counter clockwise, then clockwise for best picture and MINIMUM snow without distortion or overload.

B. Focus
Adjust the beam alignment magnet on the neck of the picture tube for best focus.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate audio detector buzz, adjust the buzz control for MINIMUM buzz and maximum sound. (For location, see tube placement chart).

FUSE DEVICE

A circuit breaker is used for LV power supply protection and may be reset by depressing the reset button.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

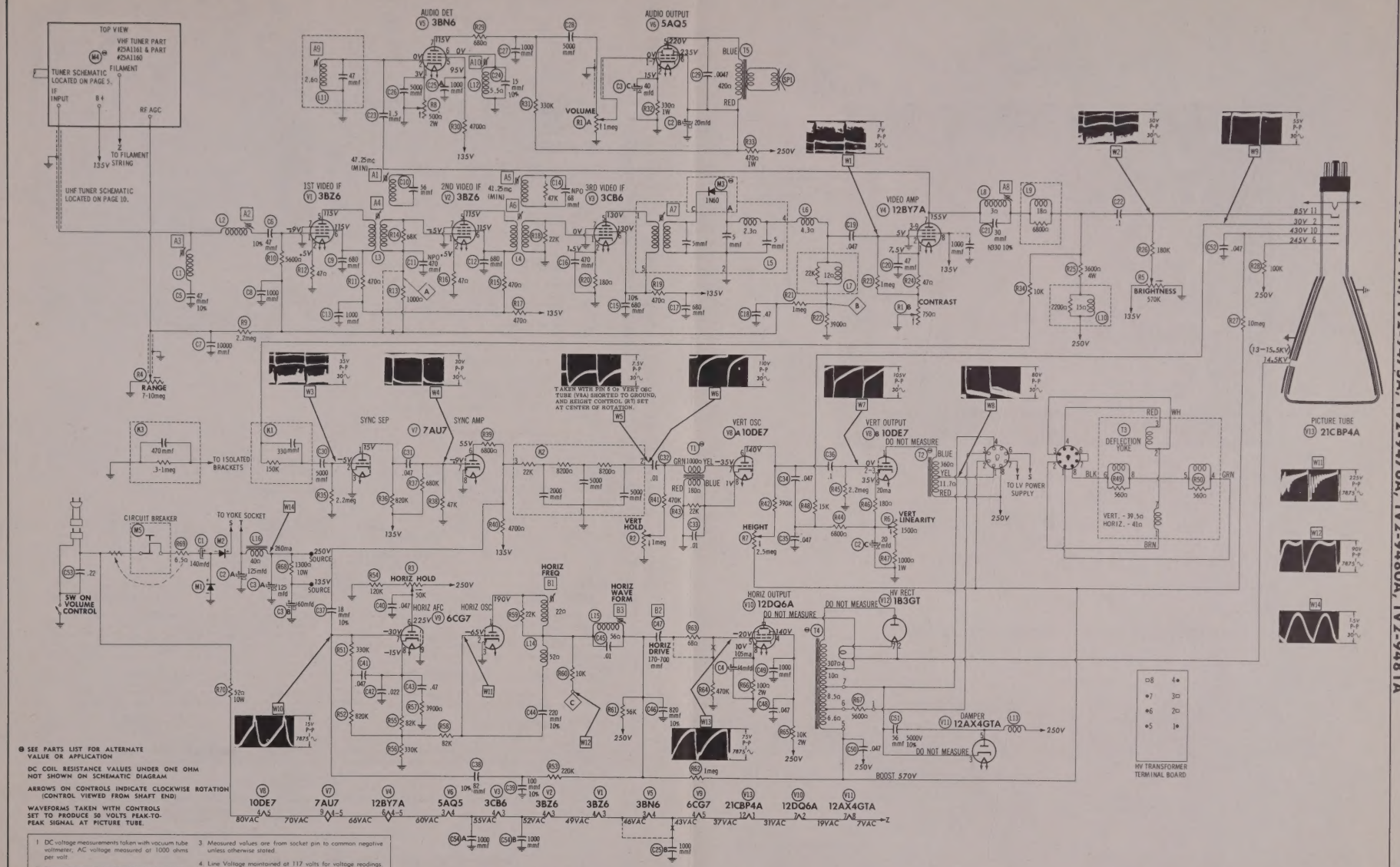
CORONADO MODELS TV2-9465A, TV2-9466A, TV2-9470A, TV2-9471A, TV2-9475A, TV2-9476A, TV2-9480A, TV2-9481A

SET 407 FOLDER 1

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

H414R



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

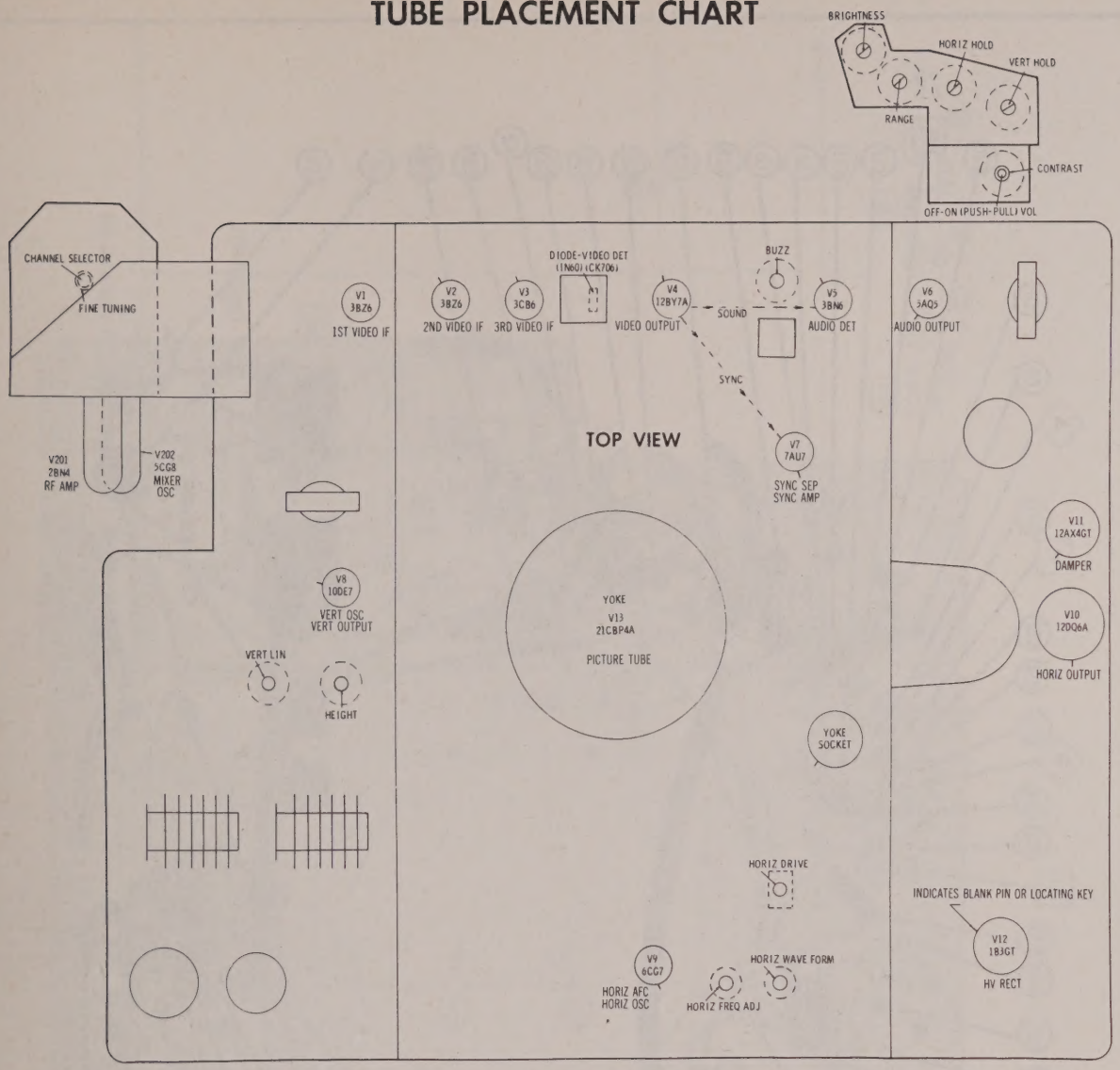
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

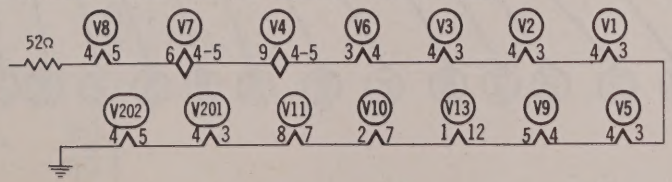
POWER SUPPLY FAILURE
No raster, no sound - **Circuit Breaker (M5), Rectifier (M1, M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V1, V2, V3, Diode (M3), V4**
No pic, no sound, has snow - **V201, V202, V1**
No pic, has sound, has raster - **V4, V13**
Has pic, no sound - **V5, V6**

SYNC FAILURE
No vert. sync - **V7**
No horiz. sync - **V7, V9**
No vert. or horiz. sync - **V7**

SWEEP FAILURE
No raster, has sound - **V9, V10, V11, V12, V13**
No vertical deflection - **V8**
Poor vert. linearity or foldover - **V8**
Poor horiz. linearity or foldover - **V9, V10, V11**
Narrow picture - **V9, V10, V11, M1, M2**
Vert. off freq. - **V8**
Horiz. off freq. - **V9**

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).



TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.

VHF OSCILLATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the negative lead of a 1.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Set Local-Distant switch to "Local" and contrast control fully counter clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 201	Across antenna terminals thru network (Fig. 201).	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K across video detector load.	A201	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A202	
			201MC	199.25MC 203.75MC	11		A203	
			195MC	193.25MC 197.75MC	10		A204	
			189MC	187.25MC 191.75MC	9		A205	
			183MC	181.25MC 185.75MC	8		A206	
			177MC	175.25MC 179.75MC	7		A207	
			85MC	83.25MC 87.75MC	6		A208	
			79MC	77.25MC 81.75MC	5		A209	
			69MC	67.25MC 71.75MC	4		A210	
			63MC	61.25MC 65.75MC	3		A211	
			57MC	55.25MC 59.75MC	2		A212	

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Antenna coils (A215 and A217 thru A227) are adjusted thru a rectangular hole on the opposite side of the tuner from the oscillator slug adjustments.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Fig. 201	Across VHF antenna terminals thru matching network (Fig. 201).	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point U. Low side to chassis.	A213, A214, A215, A216	Connect a 22Ω ½ watt carbon resistor across the terminals of the channel 10 antenna coil (A215). Adjust A213 and A214 for a balanced response curve similar to Fig. 203. Remove 22Ω resistor from A215. Adjust A215 by expanding or compressing coil turns for maximum gain between markers with balanced peaks. If the valley is not centered between the two balanced peaks, remove the B plus to the tuner and adjust A216 with a non-metallic alignment tool until the valley is centered between peaks as in Fig. 204. Reconnect B plus to the tuner. Replace tuner shield on tuner.
3.	"	"	213MC	211.25MC 215.75MC	13	"	A217	Adjust for maximum gain and symmetry similar to Fig. 203.
4.	"	"	207MC	205.25MC 209.75MC	12	"	A218	"
5.	"	"	201MC	199.25MC 203.75MC	11	"	A219	"
6.	"	"	189MC	187.25MC 191.75MC	9	"	A220	"
7.	"	"	183MC	181.25MC 185.75MC	8	"	A221	"
8.	"	"	177MC	175.25MC 179.75MC	7	"	A222	"
9.	"	"	85MC	83.25MC 87.75MC	6	"	A223	"
10.	"	"	79MC	77.25MC 81.75MC	5	"	A224	"
11.	"	"	69MC	67.25MC 71.75MC	4	"	A225	"
12.	"	"	63MC	61.25MC 65.75MC	3	"	A226	"
13.	"	"	57MC	55.25MC 59.75MC	2	"	A227	"

PRE-ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	44.5MC (10MC Swp)	47.25MC	Any non-interfering channel	Vert. Amp. thru detector (Fig.1) to pin 5 (plate) of 3BZ6 (V1). Low side to chassis.	A1	Adjust to place marker in trap notch as in Fig. 2.
2.	"	"	"	41.25MC	"	"	Mixer Plate Coil & A2, A3	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. The mixer plate coil and A2 shape the top of response. A3 places 41.25MC marker. A3 must be adjusted accurately or sound rejection will not be correct. The 45.75MC marker must be placed exactly on peak or the 44.5MC marker will not be correct in following steps.
3.	"	"	"	42.8MC	"	Vert. Amp. thru 10K to point (B). Low side to chassis. DC probe of VTVM to point (B). Common to chassis. (Across video det. load).	A4	Adjust sweep output for -2 volts on VTVM. Adjust A4 for maximum gain at marker.
4.	"	"	"	41.25MC	"	"	A5	Adjust for MINIMUM gain at marker.
5.	"	"	"	45.3MC	"	"	A6	Adjust for maximum gain at marker.
6.	"	"	"	44.0MC	"	"	A7	"
7.	"	"	"	41.25MC 42.4MC 42.8MC 44.0MC 44.3MC 44.5MC 45.75MC 47.25MC	"	"		Check for response similar to Fig. 3 with markers as shown. The 44.5MC is critical so if necessary, retouch A7 to place 44.5MC marker at 98%. If necessary, retouch A6 for correct position of 45.75MC marker and A4 to position 42.8MC marker. (A4 seldom needs retouching). DO NOT retouch mixer plate coil or A2.

4.5MC TRAP ALIGNMENT

Use 0-10 volt AC scale on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	AC probe to pin 11 (cathode) of picture tube. Common to chassis.	A8	Adjust for MINIMUM deflection. This adjustment can be made while observing a picture from a station. Adjust for MINIMUM beat (grain) interference in picture.

SOUND IF ALIGNMENT

Tune in a TV station and reduce the signal strength by use of an attenuator or similar device until a hiss similar to super regenerator is heard in the sound.
Adjust A9, A10 and the buzz control (R8) for maximum undistorted sound with MINIMUM buzz.
If the hiss disappears during alignment, further reduce the signal strength until the hiss returns.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

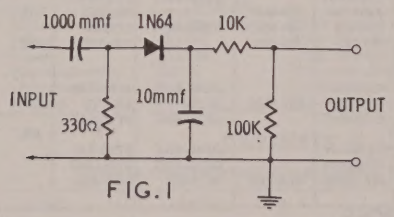


FIG.1

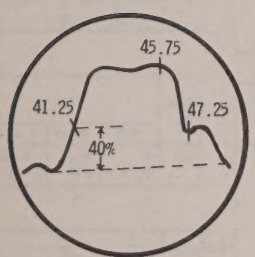


FIG.2

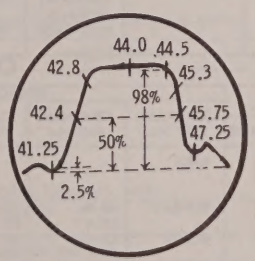


FIG.3

CORONADO MODELS TV2-9465A, TV2-9466A, TV2-9470A, TV2-9471A, TV2-9475A, TV2-9476A, TV2-9480A, TV2-9481A

FOLDER 1

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st Video IF Amp.	3BZ6	
V2	2nd Video IF Amp.	3BZ6	
V3	3rd Video IF Amp.	3CB6	
V4	Video Output	12BY7A	
V5	Audio Det	3BN6	
V6	Audio Output	9AQ8	
V7	Sync Sep. -Sync Amp.	7AU7	
V8	Vert. Osc. -Vert Output	10DE7	
V9	Horiz AFC-Horiz. Osc.	6CG7	
V10	Horiz Output	14DQ8A	
V11	Damper	1AX4GTA	
V12	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No	REPLACEMENT DATA			NOTES
	CORONADO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V13	21CBP4A		21CBP4-A ①	21CBP4/ 21CBP4A ③	① "Silverama" ③ ② "Silver screen 66"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA							
	CAP.	VOLT	CORONADO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	
C1	140	150	45X421	AFH51-23	XA0251	FP117	TM3-24	T-055	TVL-1428	
C2A	125	300	45X431	AFH4-03-60	XC0733.2	FP218		Q-017	*R2376	
B	60	300				TC36		MT-0525		
C	20	50								
C3A	125	300	45X420	AFH3-99-82	C0733.7	FP420.76		T-115	TVL-3574.6	
B	60	300				TC65		MT-0550		
C	40	50								
C4	4	50	45X418	PRS150V4	BBR4-50	TC30	ML5-50	MT-0504	TE-1303	

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA								NOTES
	CAP.	VOLT	CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.		
C5	47			NPO-DI 47	D6-470	L10Q47	ED-47		MS-447	10%	
C6	47			NPO-DI 47	D6-470	L10Q47	ED-47		MS-447	10%	
C7	10000			BPD-001	DD-103	BYA6S1	ED-01	DC521	5HK-S1		
C8	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1		
C9	680			BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68		
C10	56			NPO-DI 56	TCZ-56	L10Q56	TCO-56				NPO
C11	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47		
C12	680			BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68		
C13	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1		
C14	82			NPO-DI 56	TCZ-48	C10Q82C	TCO-48		STCC-Q82		NPO
C15	680				D6-681	1R5T68	ED-680	UC-5368	MS-368		10%
C16	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47		
C17	680			BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68		
C18	.47	200		P288N-47		CUB2P47		GEM-2047	2TM-P47		
C19	.047	200		P288N-047		DF-503	CUB2S47	GEM-4147	2TM-S47		
C20	47			SI 47		D6-470	GP-47	UC-5447	5GA-Q47		
C21	30		47X669								N330 10%
C22	.1	400		P488N-1		DF-104	CUB4P1		GEM-401	4TM-P1	
C23	1.5			NPO-SI 1.5		TCZ-1R5	CTA6V15C	TCO-1.5	ZT-5515	STCCB-V15	
C24	15			NPO-DI 15		DD-150	L10Q15	ED-15		MS-415	10%
C25A	1000			BPD-2X001		DD2-102	BYC6DDI	ED2-001	DCD521	5HK-2DI	
B	1000										
C26	5000			BPD-005		DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C27	1000			BPD-001		DD-102	BYA6DI	ED-001	DC521	5HK-D1	
C28	5000			BPD-005		DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C29	.0047	600		P688N-0047		D6-473	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C30	5000			BPD-005		DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C31	.047	400		P488N-047		DF-503	CUB4S47		GEM-4147	4TM-S47	
C32	.01	400		P488N-01		D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C33	.01	400		P488N-01		D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C34	.047	400		P488N-047		DF-503	CUB4S47		GEM-4147	4TM-S47	
C35	.047	200		P288N-047		DF-503	CUB2S47		GEM-4147	2TM-S47	
C36	.1	400		P488N-1		DF-104	CUB4P1		GEM-401	4TM-P1	
C37	18		RCM20B180K	1469-000018		D6-180	22R5Q18	ED-18		MS-418	10%
C38	82		RCM30B820K	1469-000082		D6-820	22R5Q82	ED-82		MS-482	10%
C39	100			1469-0001		D6-101	22R5T1	ED-100	MCB235	MS-31	10%
C40	.047	400		P488N-047		DF-503	CUB4S47		GEM-4147	4TM-S47	
C41	.047	200		P288N-047		DF-503	CUB2S47		GEM-4147	2TM-S47	
C42	.022	200		P288N-022		DD-203	CUB4S22	ED-02	GEM-4122	2TM-S22	
C43	.47	200		P288N-47			CUB2P47		GEM-2047	2TM-P47	
C44	220			1469-00022		D6-221	22R5T22	ED-220		MS-322	10%
C45	.01	400		P488N-01		D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C46	820		RCM20B821K	1464-00082			1R5T82	ED-820		MS-382	10%
C47	170-700		17A371								
C48	.047	400		P488N-047		DF-503	CUB4S47		GEM-4147	4TM-S47	
C49	1000			BPD-001		DD-102	BYA6DI	ED-1000	DC521	5HK-D1	
C50	.047	400		P488N-047		DF-503	CUB4S47		GEM-4147	4TM-S47	
C51	56	5000	47X756								10%
C52	.047	600		P688N-047		DF-503	CUB6S47		GEM-6147	6TM-S47	
C53	.22	400		P488N-22			CUB4P22		GEM-4022	4TM-P22	
C54A	1000			BPD-2X001		DD2-102	BYC6DDI	ED2-001	DCD-521	5HK-2DI	
B	1000										

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	750Ω	½	78X31				U51168	Contrast
B	1meg	½					Not Req.	Volume
C	Switch						Not Req.	
R2A	1meg	½	40X428	AB-69	A47-1meg-S	Q1-137	U54	Vert. Hold
B	Shaft			AK-8 *	RS-3/16 *	NQ	D8-37 *	
R3A	50K	½	40X427	AB-31	A47-50K-S	Q1-123	U35	Horiz. Hold
B	Shaft			AK-8 *	RS-3/16 *	NQ	D8-37 *	
R4A	7-10meg	½	40X439				U52 †	Range
B	Shaft						Not Req.	
R5A	570K	½	40X426	AB-69	A47-500K-S	Q1-133	U50	Brightness
B	Shaft			AK-8 *	RS-3/16 *	NQ	D8-37 *	
R6A	1500Ω	½	40X399	AB-6	A47-1500-S	Q1-109	PTA152L	Vert. Lin.
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R7A	2.5meg	½	40X398	BX-83	A47-2.5meg -S	Q1-239	TA165L	Height
B	Shaft			Not Req.	FKB-1/4	TQ	Not Req.	
R8	500Ω	2(WW)	40X397		39-500		FL-500	Buss

* File flat as needed to fit knob.
† Do not solder any wires to left hand terminal.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		CORONADO PART No.	NOTES
	OHMS	WATT		
R9	2.2meg			
R10	2800Ω			
R11	470Ω			
R12	47Ω			
R13	1000Ω			
R14	68K			
R15	470Ω			
R16	47Ω			
R17	470Ω			
R18	22K			
R19	470Ω			
R20	180Ω			
R21	1meg			
R22	3900Ω			
R23	1meg			
R24	47Ω			
R25	3800Ω	4	43X331	
R26	180K			
R27	10meg			
R28	100K			
R29	680Ω			
R30	4700Ω			
R31	330K			
R32	330Ω	1		
R33	470Ω	1		
R34	10K			
R35	2.2meg			
R36	820K			
R37	680K			
R38	47K			
R39	6800Ω			
R40	4700Ω			
R41	470K			
R42	390K			
R43	22K		B84223	
R44	6800Ω			
R45	2.2meg			
R46	180Ω		B84181	
R47	1000	1		
R48	15K			
R49	560Ω			
R50	560Ω			
R51	330K			
R52	820K			
R53	220K			
R54	120K			
R55	82K			
R56	330K			
R57	3900Ω			
R58	82K			
R59	22K			
R60	10K			
R61	56K			
R62	1meg			
R63	68Ω			
R64	470K			
R65	10K	2		
R66	100Ω	2		
R67	5600Ω			
R68	1300Ω	10	43X399	
R69	6.5Ω	10	43X303	
R70	52Ω	10	43X302	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							NOTES
		CORONADO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	Vert. Osc.	54X19-A	B6702	A-3003	V405	A-8125	26A03	A-97X	
	Alt. Vert. Osc.	54X19							
T2	Vert Output	51X186B	Z1900 ⑫	A-3038 ⑬	V307 ⑬	VO-100 ⑬	26S73 ③	A-118X ③	
	Alt. Vert. Output	51X186							
T3A	Yoke-Horiz. (24.5MH)	9A-2403 ③	DF607 ⑤⑥	MDF-62 ⑤⑥	Y90F10/43 ⑤⑥	DY-16A ⑤⑥	Y-16 ⑤⑥	Y-45 & NW21 ⑥	
B	(90°)-Vert. (39MH)								
M6	Rear Cover & Centering Device	2A435						YCI CLI	
	Yoke Clamp	30X611							
	Rubber Strip	83X247							
T4	Horiz. Output	53X364C	FB419 ③	*HVO-36 ③	X094 ③	HO-383*	FLY-16 ③	D-121 *	
	Alt Horiz. Output	53X364	FB419 ③	* HVO-36 ③	X094 ③	HO-283*	FLY-16 ③	D-121 *	

① Connect as autoformer.
② Use 9 to 1 turns ratio.
③ Drill new mounting hole(s).
④ Includes resistors (R49, R50).
⑤ Use original rear cover, centering device and horizontal damping network.
⑥ Connect same as original.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4	9	9	9	8	9	4
7	7	7	7	3	7	3
8	See Note ⑦ NC	See Note ⑦ NC	See Note ⑦ NC	2	See Note ⑦ NC	2
5	1	1	1	1	1	1
Special Notes →	⑦	⑦	⑦		⑦	

⑦ Install new damping network consisting of approximately 50mmf in series with resistor (R87) across horizontal yoke terminals #3 and #7.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	CORONADO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	8100Ω	3-4Ω	51X185	Z1110	A-3026	AU-802 ①	A-387X ①	24S81 ①	S-8X	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CORONADO PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	12A528 ①		① Console Models ② Table Models
	2½"x10"	PM	3-4Ω	12A549 ②		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		CORONADO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	39MC Trap	9A2369			4202		
L2	1st Video IF	9A2365		17-4534	4202	VF-4	
L3	2nd. Video IF	9A2363		17-4536	6222		Includes 47.25MC Trap
L4	3rd. Video IF	9A2414		17-4535	6221		Includes 41.25MC Trap
L5	4th. Video IF	9A2370		17-4514			Includes Assy.
L6	Resonant Choke	9A2375					30 Microhenries
L7	Shunt Peaking Coil	36A18		19-4160 *	TV-184 *	6120 *	160 Microhenries, wound on 22K resistor

COILS (cont)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		CORONADO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L8	4.5MC Trap	9A2366	20-1004	TV-151	1469 ▲	SF-3	
L9	Series Peaking Coil	36A18	19-4400 *	TV-190 *	6132 *	VP-7 *	250 Microhenries, wound on 6800Ω resistor
L10	Shunt Peaking Coil	36A33	19-3250 †	TV-185 †	6181 †	VP-6 †	235 Microhenries, wound on 2200Ω resistor
L11	Sound IF	9AJ400	17-1026	TV-154	1470A ▲		
L12	Quadrature Coil	9A2367	20-1008	TV-131	1480		
L13	RF Choke	9A2380	19-1001	BC-563	4604		1.8 Microhenries

* Parallel with 22K resistor.
* Parallel with 6800Ω resistor.
† Parallel with 2200Ω resistor.
▲ Disregard tap.
▲ Drill mounting holes.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CORONADO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L14	74Ω *		9A2371		TV-165	6211 ▲		25S-7	Horiz. Freq.
L15	56Ω		9A2372			6315		25S-5 ▲	Horiz. Waveform

* Tapped ② 52Ω.
▲ Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES	INDUCTANCE @ CURRENT 1000 (∿)	CORONADO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L16	260A	40Ω	1 Hy	52X95-8	C6037 ①	C-2991 ①		C-2326 ①	28C43 ①	C-27X

① Drill new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	CORONADO PART No	REPLACEMENT DATA	
K1	Sync Coupling	330mmf, 150K	76X13		
K2	Vert. Integrator	2000mmf, 5000mmf, 5000mmf, 22K, 2200Ω, 820Ω	76X7	Aerovox	PA-110
				Centralab	PC-104
				Cornell-Dubilier	118TM1
				Erie	1406-01
				Sprague	V-1
K3	Chassis Isolation	470mmf, .3-1meg	76X11	Centralab	RC-471
				Sprague	R-9177

RECTIFIERS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CURRENT (Measured)		CORONADO PART No.	FEDERAL PART No	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No	SARKES TARZIAN PART No.		
M1	.260A		66X14 ①	1090A ①	1N1007 ②	RS309SL ①	300 ①	① Selenium type.	
						SD94A ③	M500 ③	② Germanium type	
M2	.26*A		66X14 ①	1090A ①	1N1007 ②	RS309SL ①	300 ①	③ Silicon type.	
						SD94A ③	M500 ③		

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		CORONADO PART No.	CBS PART No.	SYLVANIA PART No.	
M3	1N60 *			1N60	Video Detector (Pigtail).

* Some versions may use CK706 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M4	Tuner	25A1161	VHF (Standard Coil #NAS-4130)
	Tuner	25A1160	VHF (Standard Coil #NAS-4145)
	Tuner	25A1159	UHF (Standard Coil #NEUFS-103)
M5	Circuit Breaker	2A475	Thermal cutout
M6	Centering Device	2A435	Includes yoke cover
	Magnet	2A476	Beam alignment used with some picture tubes

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

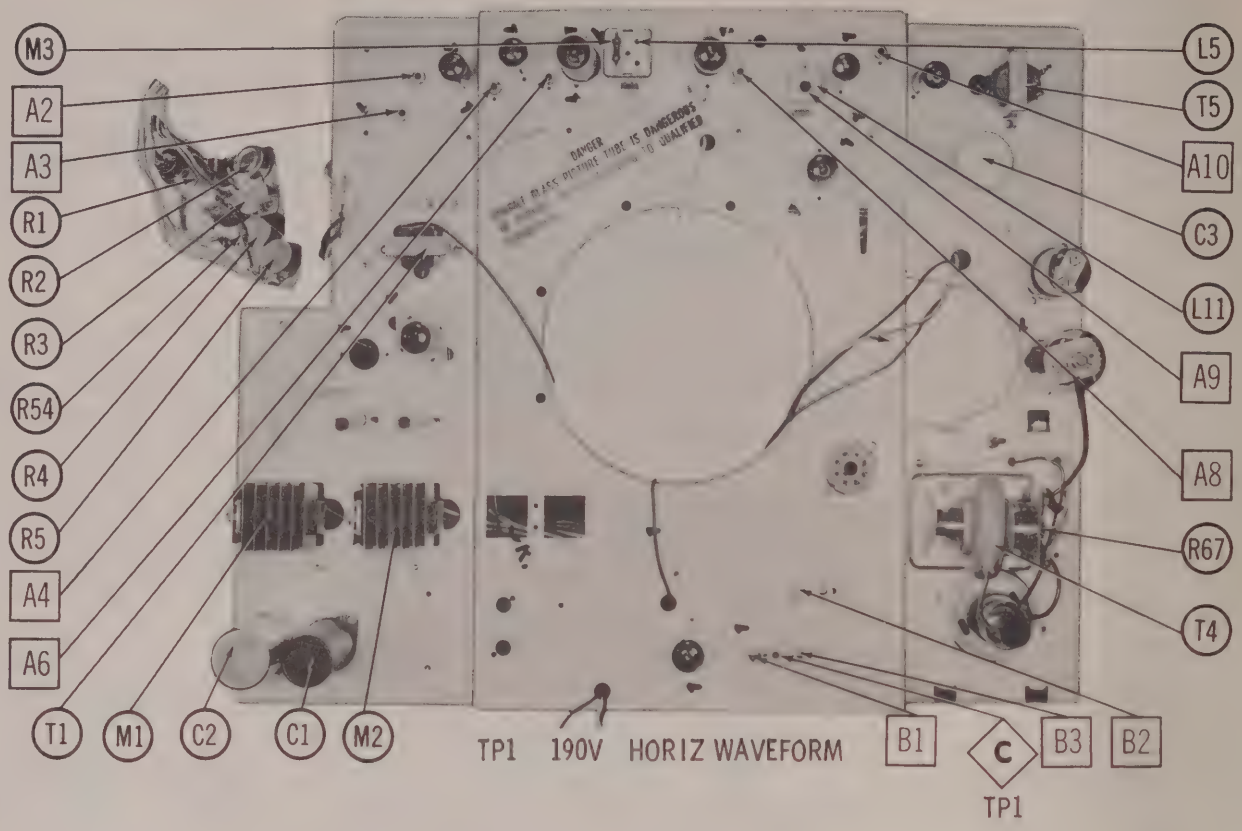
NAME	PART NO.	DESCRIPTION
Safety Glass	17X194-1	
Knob	10A899-1	Channel Selector
Knob	10A893-2	UHF Tuning
Knob	10A894-2	UHF Indicator
Knob	10A895-1	Fine Tuning
Knob	10A896-1	Contrast
Knob	10A897-1	On-off-volume
Knob	10A881-1	Brightness, range, horiz. hold, vert hold

WIRING DATA

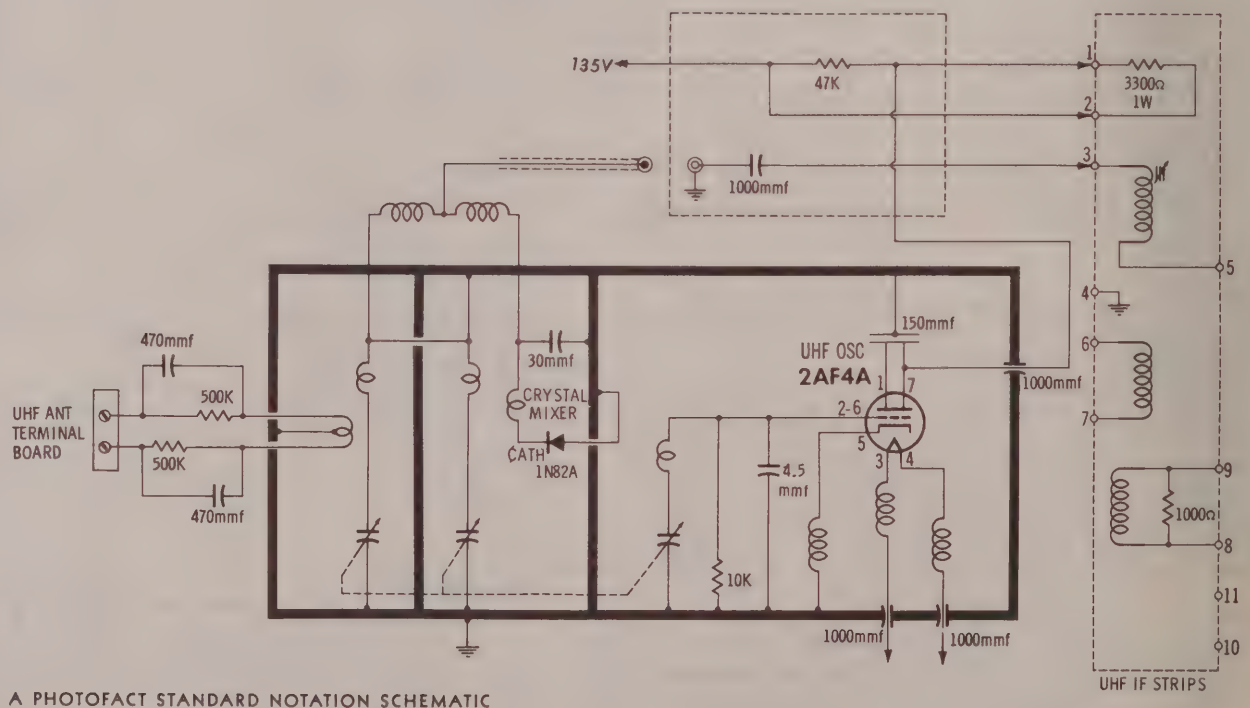
High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8484 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

CORONADO MODELS TV2-9465A, TV2-9466A, TV2-9470A, TV2-9471A, TV2-9475A, TV2-9476A, TV2-9480A, TV2-9481A

FOLDER 1

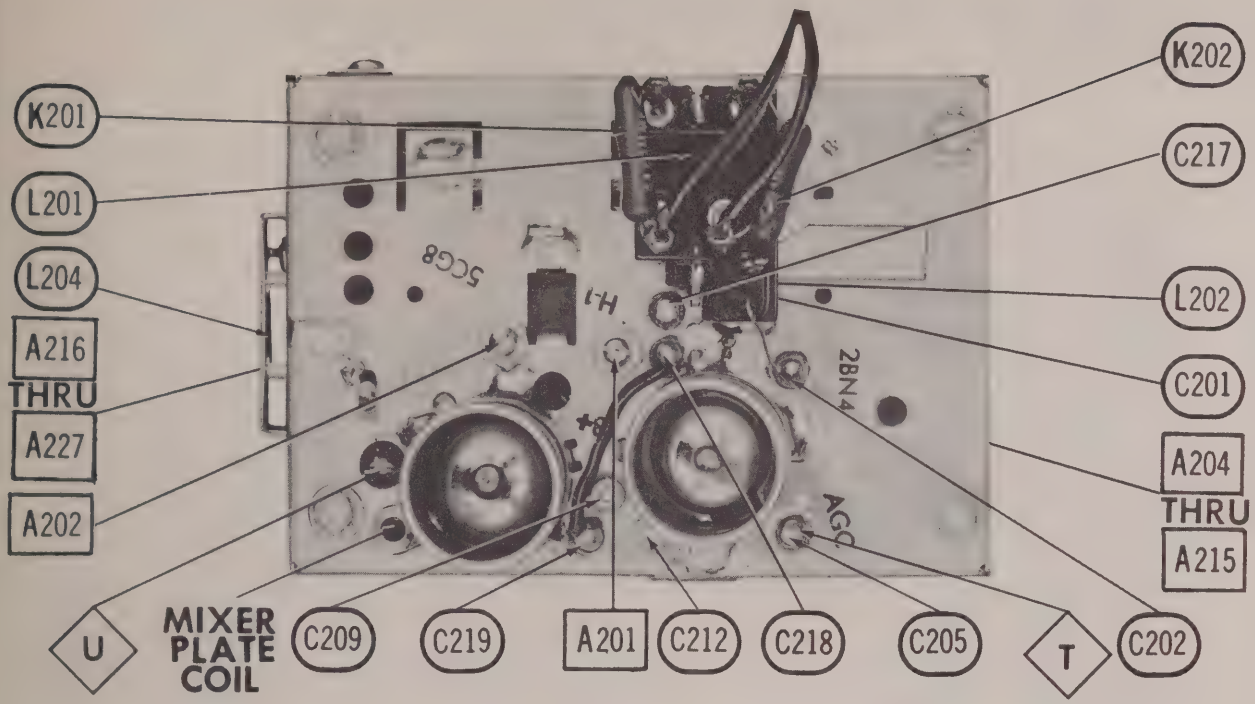


CHASSIS TOP VIEW

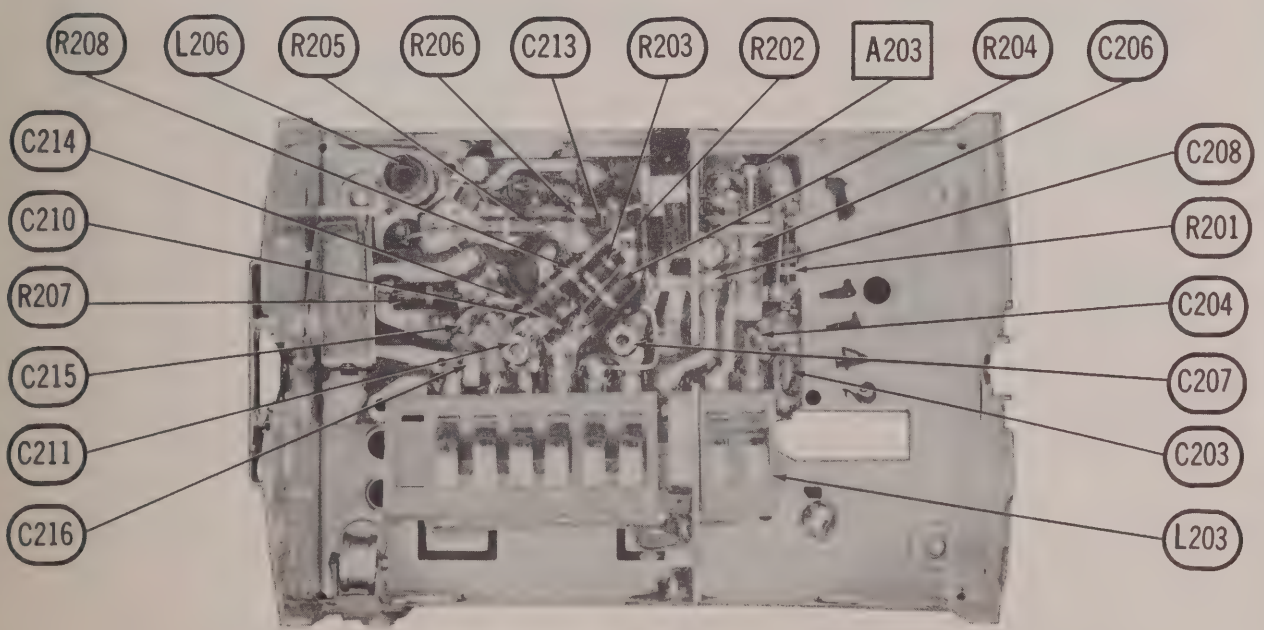


A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

UHF TUNER #25A1159



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amplifier	2BN4	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	120			NPO-DI 120	TCZ-120	C10T12C	TCO-120		5TCC-T12	10%
C202	30		13M320EA300J-05							
C203	28		13R-005							10%
C204	12		13R-003							10%
C205	800		13M320EA801Z-04							
C206	1.5-4.5				829-6		532-B			
C207	1-4.5		31B-902-07		829-6		532-B			
C208	47		13M130U470J							5%
C209	800		13M320EA801Z-04							
C210	47									10%
C211	1.4.5		31B-902-07		829-6		532-B			
C212	30		13M320EA300M-06							
C213	1000		13R-024							
C214	3		13R-011							10%
C215	6.8		13R-014							N330
C216	2.0		13R-009							5%
C217	800		13M320EA801Z-04							
C218	800		13M320EA801Z-04							
C219	800		13M320EA801Z-04							

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PART No.	NOTES
	OHMS	WATT		
R201	4700Ω			
R202	1000Ω			
R203	3900Ω			
R204	220K			

ITEM No.	RATING		PART No.	NOTES
	OHMS	WATT		
R205	1000Ω			
R206	10K			
R207	10K			
R208	6800Ω			

COILS (RF-IF)

ITEM No.	USE	PART No.	NOTES
L201	Ant. Trans.	31T-2107-01	
L202	IF Trap Coil	34A-748	
L203	IF Trap Coil	31TA-2109	
L204A	Ant., RF, Mixer Grid, Osc. Coils	31M-300-2N4A	Channel 2
B	"	31M-300-3N4A	Channel 3
C	"	31M-300-4N4A	Channel 4
D	"	31M-300-5N4A	Channel 5
E	"	31M-300-6N4A	Channel 6
F	"	31M-300-7N4A	Channel 7
G	"	31M-300-8N4A	Channel 8

ITEM No.	USE	PART No.	NOTES
L204H	Ant.,RF, Mixer Grid, Osc. Coils	31M-300-9N4A	Channel 9
I	"	31M-300-10N4A	Channel 10
J	"	31M-300-11N4A	Channel 11
K	"	31M-300-12N4A	Channel 12
L	"	31M-300-13N4A	Channel 13
L205	RF Choke	25A-176-01	
L206	Mixer Plate Coil	31U-530-01	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA	
K201	Antenna Isolation	470mmf, .3-1meg	13P-198	Centralab Sprague	RC-471 R-9177
K202	Antenna Isolation	470mmf, .3-1meg	13P-198	Centralab Sprague	RC-471 R-9177

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
	Drum Osc. Slug	31T-2073-171-02 15A-266	Less strips 12 required

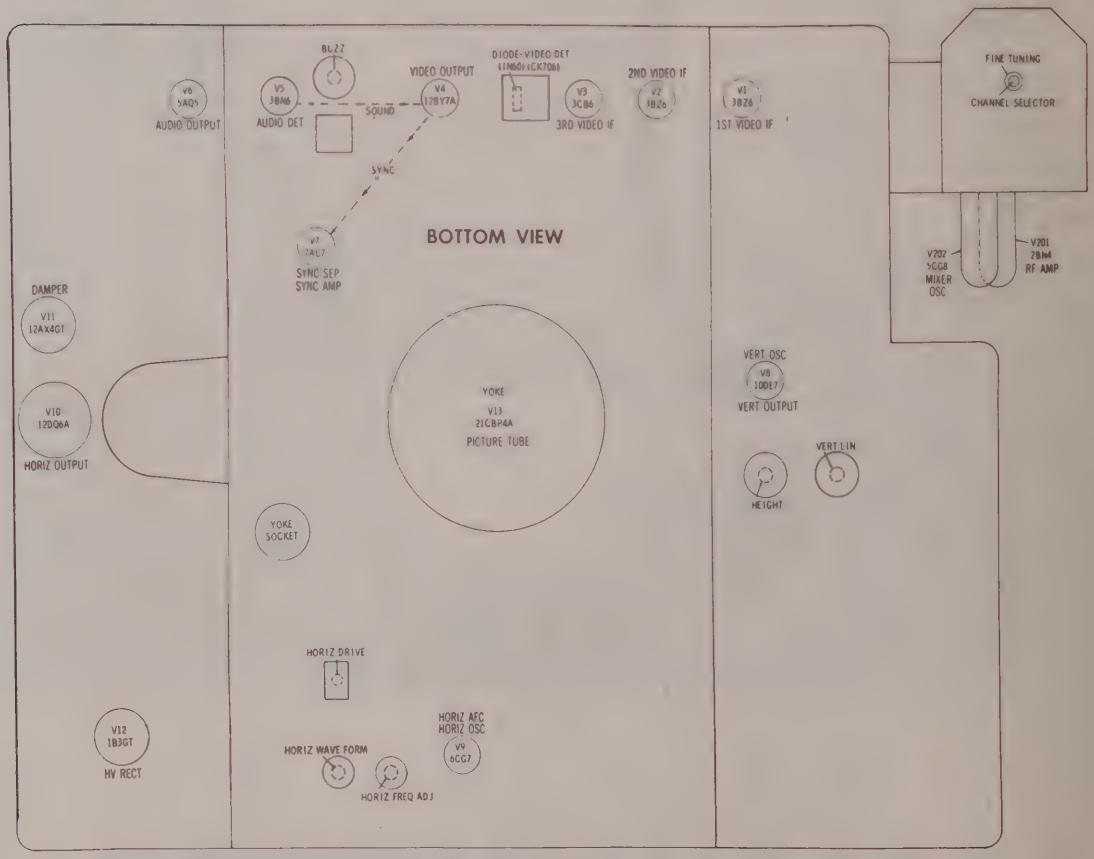
NOTE : Part numbers listed above are "Standard Coil" part numbers.

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

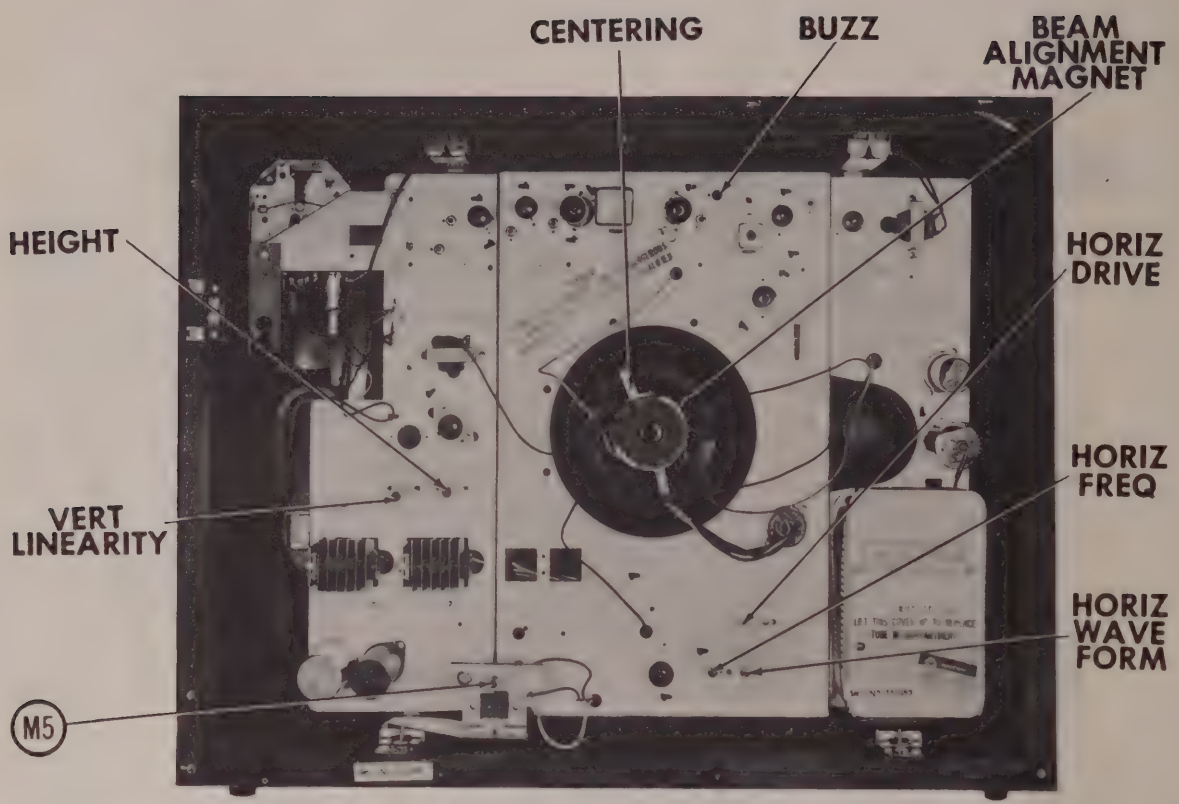
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	1meg	47Ω	10Ω	10.5Ω	† 2200Ω	† 2200Ω	0Ω		
V2	3BZ6	1meg	47Ω	10.5Ω	11.5Ω	† 2200Ω	† 2200Ω	0Ω		
V3	3CB6	.1Ω	180Ω	11.5Ω	12Ω	† 1700Ω	† 1700Ω	0Ω		
V4	12BY7A	• 190Ω	1meg	0Ω	13Ω	13Ω	14Ω	† 3600Ω	† 1200Ω	0Ω
V5	3BN6	• 280Ω	2.6Ω	10Ω	9.5Ω	† 5900Ω	5.5Ω	† 330K		
V6	5AQ5	0Ω	330Ω	13Ω	12Ω	† 890Ω	† 470Ω	0Ω		
V7	7AU7	† 820K	2.2meg	0Ω	14Ω	14Ω	† 13K	45K	0Ω	15Ω
V8	10DE7	† 370Ω	2.2meg	2.2meg	16Ω	15Ω	•ǂ 1.9meg	• 750K	160Ω	• 1400Ω
V9	6CG7	† 56K	410K	0Ω	9.5Ω	8.5Ω	•† 13K	1.5meg	410K	0Ω
V10	12DQ6A	TP	4Ω	NC	† 10K	470K	NC	7Ω	100Ω	TOP CAP ǂ 10Ω
V11	12AX4GTA	NC	NC	¶	NC	† .1Ω	NC	4Ω	1.5Ω	
V12	1B3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP ǂ 317Ω
V13	21CBP4A	7Ω	22K	PIN 6 † 100K	PIN 10 ǂ 10meg	PIN 11 • 260K	PIN 12 8.5Ω			
V201	2BN4	0Ω	1meg	1.5Ω	1Ω	† 2300Ω	0Ω	1meg		
V202	5CG8	10K	† 8100Ω	0Ω	0Ω	1Ω	† 2300Ω	† 11K	0Ω	220K

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 250V SOURCE.
ǂ MEASURED FROM PIN 3 OF V11.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the horizontal hold control fully clockwise. Tune in a station and adjust the horizontal frequency slug (B1) until the picture is just about to tear out of sync as can be seen at the top of the picture.

Turn the contrast control fully counter clockwise and the brightness control clockwise so that the picture appears washed out. Turn the horizontal drive trimmer (B2) clockwise until white vertical bars (drive lines) appear in the left center portion of the raster, then counter clockwise until the white bars just disappear.

Connect the vertical amplifier of the scope to point Ⓒ. Low side to chassis. Adjust the horizontal waveform slug (B3) until the round and sharp peaks of the waveform are equal in amplitude. (See Fig. 4). Keep the picture in sync during this adjustment.

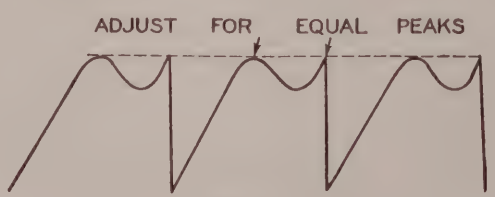


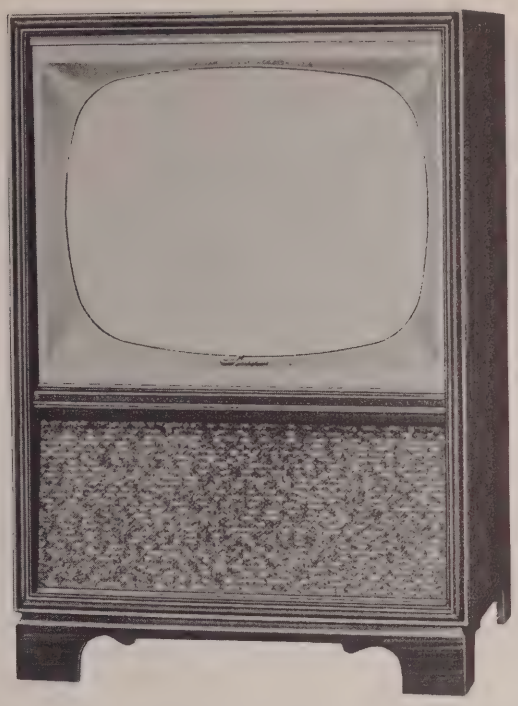
FIG. 4

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SPARTAN CHASSIS U25-01AA thru U25-11AA, V25-01AA thru V25-11AA (25 Series)

SPARTAN CHASSIS U25-01AA thru U25-11AA, V25-01AA thru V25-11AA (25 Series)



DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 10 push-on type knobs from the top.

2. Remove 11 wood screws holding the rear cover. Remove the rear cover.

3. Remove the speaker leads and ground strap to tuner and control bracket.

4. Using the horseshoe shape spanner wrench supplied with cabinet, remove 2 nuts from the on-off-volume and contrast controls which hold the tuner and control bracket to the cabinet.

5. Remove 6 bolts from the bottom holding the chassis mounting board.

6. Remove the chassis.

TRADE NAME	Spartan
CHASSIS	U25-01AA, U25-02AA, U25-03AA, U25-04AA, U25-05AA, U25-06AA, U25-07AA, U25-08AA, U25-09AA, U25-10AA, U25-11AA, V25-01AA, V25-02AA, V25-03AA, V25-04AA, V25-05AA, V25-06AA, V25-07AA, V25-08AA, V25-09AA, V25-10AA, V25-11AA (25 Series)
MANUFACTURER	Spartan Div., 2131 Bueter Road, Fort Wayne 4, Indiana
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 170 Watts, 1.57 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector and Fine Tuning knobs. Set the Fine Tuning at the center of its range. The adjustments are accessible, one at a time, as the Channel Selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws holding the metal trim at the top of the safety glass. Tilt glass out at the top and lift up to remove.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 10 or 6 and 2.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Oscillator, it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSES

One fuse is used for Horizontal Sweep circuit protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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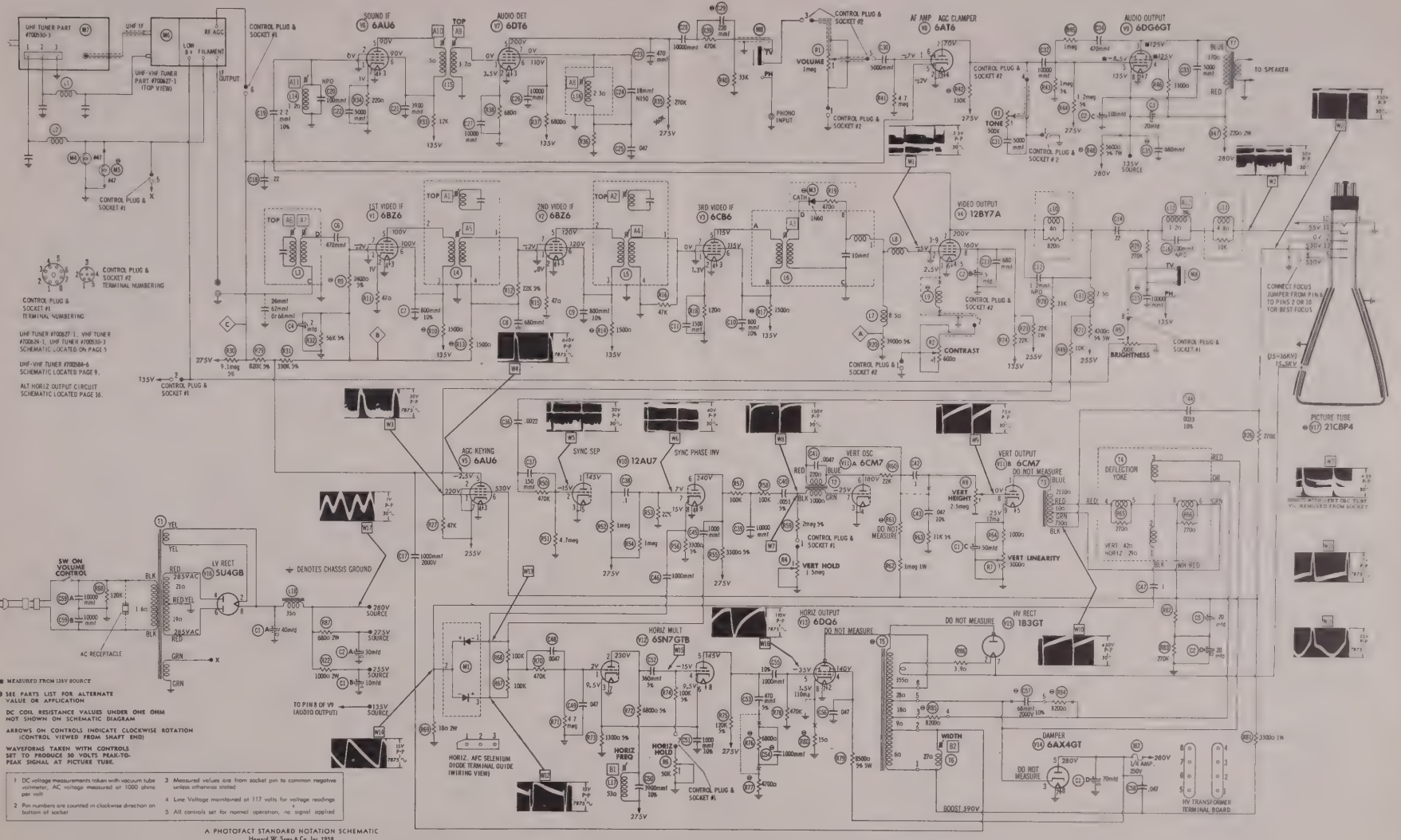
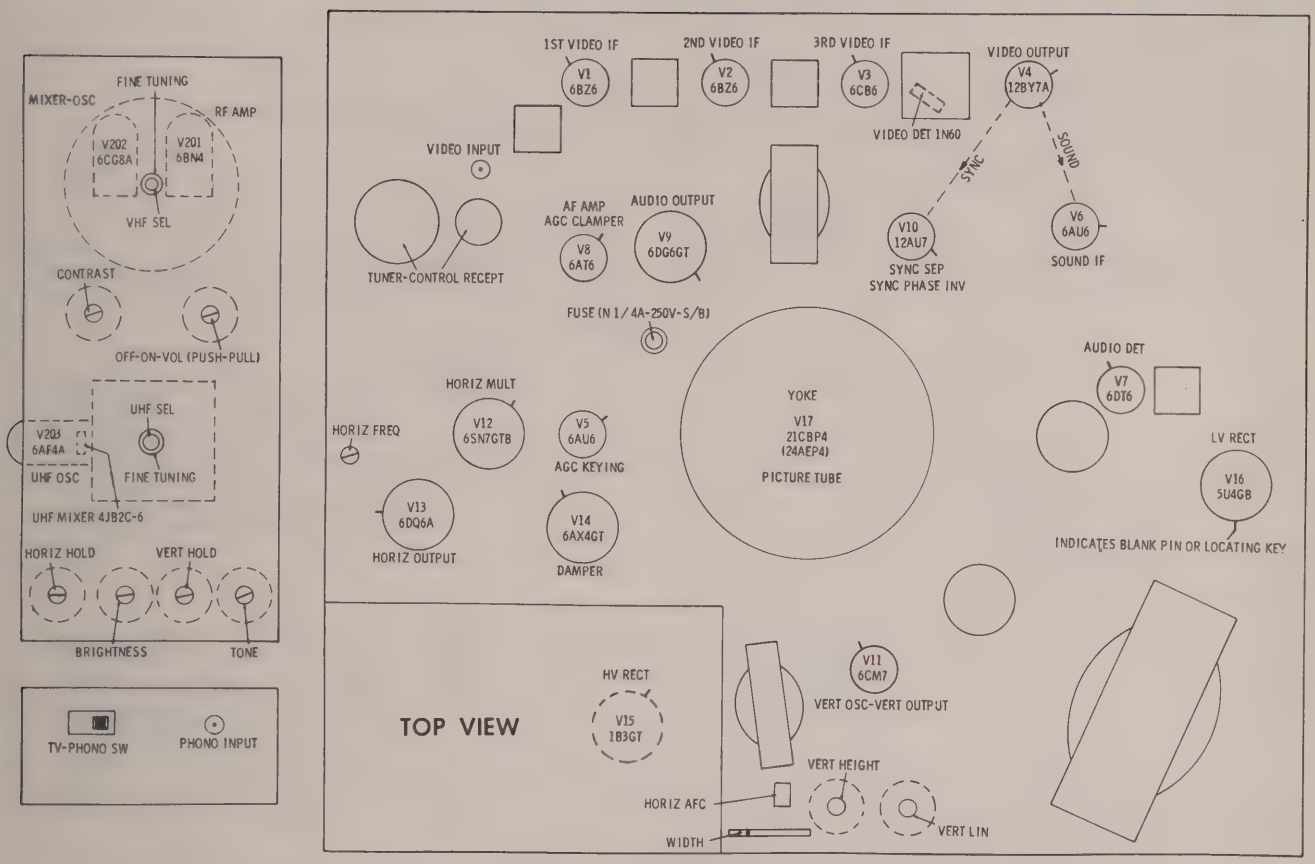
H506R

SET 407 FOLDER 2


SPARTAN CHASSIS U25-01AA thru U25-11AA,
V25-01AA thru V25-11AA (25 Series)
FOLDER 2
UHF TUNER PART #700830-3
UHF-VHF TUNER PART #700827-1 (TOP VIEW)
CONTROL PLUG & SOCKET #1
CONTROL PLUG & SOCKET #2 TERMINAL NUMBERING
SOUND IF V6 6AU6
AUDIO DET V7 6DT6
AF AMP AGC CLAMPER V8 6AT6
AUDIO OUTPUT V9 6DG6GT
1ST VIDEO IF V1 6BZ6
2ND VIDEO IF V2 6BZ6
3RD VIDEO IF V3 6CB6
VIDEO OUTPUT V4 12BY7A
AGC KEYING V5 6AU6
SYNC SEP
SYNC PHASE INV V10 12AU7
VERT OSC V11A 6CM7
VERT OUTPUT V11B 6CM7
HORIZ MULT V12 6SN7GTB
HORIZ OUTPUT V13 6DQ6
HV RECT V15 1B3GT
LV RECT V16 5U4GB
DAMPER V14 6AX4GT
PICTURE TUBE 21CBP4
VOLUME
TONE
BRIGHTNESS
CONTRAST
VERT HOLD
VERT HEIGHT
VERT LINEARITY
HORIZ HOLD
HORIZ FREQ
WIDTH
BOOST 590V
SW ON VOLUME CONTROL
AC RECEPTACLE
DENOTES CHASSIS GROUND
TO SPEAKER
PHONO INPUT
TV
PH
DEFLECTION YOKE
CONNECT FOCUS JUMPER FROM PIN 6 TO PINS 7 OR 10 FOR BEST FOCUS
HV TRANSFORMER TERMINAL BOARD
HORIZ. AFC SELENIUM DIODE TERMINAL GUIDE (WIRING VIEW)
DO NOT MEASURE
TO PIN 8 OF V9 (AUDIO OUTPUT)
■ MEASURED FROM 135V SOURCE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound V16

SWEEP FAILURE
No raster, has sound Fuse (M2), Rectifier (M1), V12, V13, V14, V15, V17
No vertical deflection V11
Poor vert. linearity or foldover V11
Poor horiz. linearity or foldover V12, V13, V14
Narrow picture V12, V13, V14, V16
Vert. off freq. V11
Horiz. off freq. V12

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (M3), V4, V9
No pic, no sound, has snow V201, V202, V1, (V203 UHF only)
No pic, has sound, has raster V4, V17
Has pic, no sound V6, V7, V8, V9
Overloaded picture V5

SYNC FAILURE
No vert. sync V10
No horiz. sync V10, M1
No vert. or horiz. sync V10

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point Ⓐ. Positive to chassis.
Connect the negative lead of a 3 volt bias supply to point Ⓑ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Detune Mixer Plate Coil by turning core fully counterclockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to pin 1 (grid) of 6BZ6 (V1). Low side to chassis.	43.5MC	47.25MC	Any non-interfering channel	Vert. Amp. thru 10K to point Ⓒ. Low side to chassis. (Across Video Det. Load)	A1, A2	Adjust to place marker in trap notch. If two points are found to do this, use the one with slug farthest counterclockwise.
2.	"	"	"	42.25MC	"	"	A3, A4, A5	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Adjust A3 for maximum gain, A4 to position 45.75MC marker and A5 to place 42.25MC marker. Recheck step 1.
3.	Direct	Place a thin insulated metal strip between the mixer-osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	41.25MC	"	"	A6	Adjust to place marker in trap notch. If two points are found to do this, use one with slug farthest counterclockwise.
4.	"	"	"	41.25MC 42.25MC 45.0MC 45.75MC	"	"	A7 & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Adjust Mixer Plate coil for maximum gain with 45.75MC marker at 50%. Adjust A7 for maximum gain and proper tilt. Due to interaction it may be necessary to repeat adjustment. Recheck step 3.

SOUND IF ALIGNMENT

Turn the Contrast control fully clockwise and A8 fully counterclockwise.
Tune in a strong TV signal(preferably with a tone signal or music). Adjust A8 just past the point of maximum sound and MINIMUM distortion.
Reduce the signal strength by disconnecting the antenna or connecting an adjustable attenuator between the antenna leads and the receiver antenna terminals so that with the Volume control set fully clockwise the sound is at a low level. Tune the Fine Tuning thru undistorted sound.
Set the Fine Tuning to the verge of distortion.
Adjust A9, A10 and A11 for MINIMUM distortion.
Readjust the Fine Tuning during adjustments of A9, A10 and A11 to keep it at the verge of distortion.

4.5MC TRAP ALIGNMENT

Tune in a TV station and turn the Fine Tuning slowly clockwise until 4.5MC beat interference becomes visible in the picture. Adjust A12 until the horizontal scanning lines are smooth and continuous.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGES 6, 16, 19.

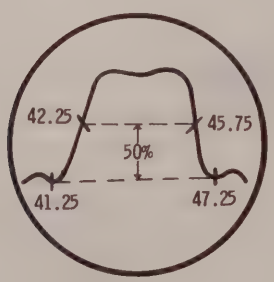
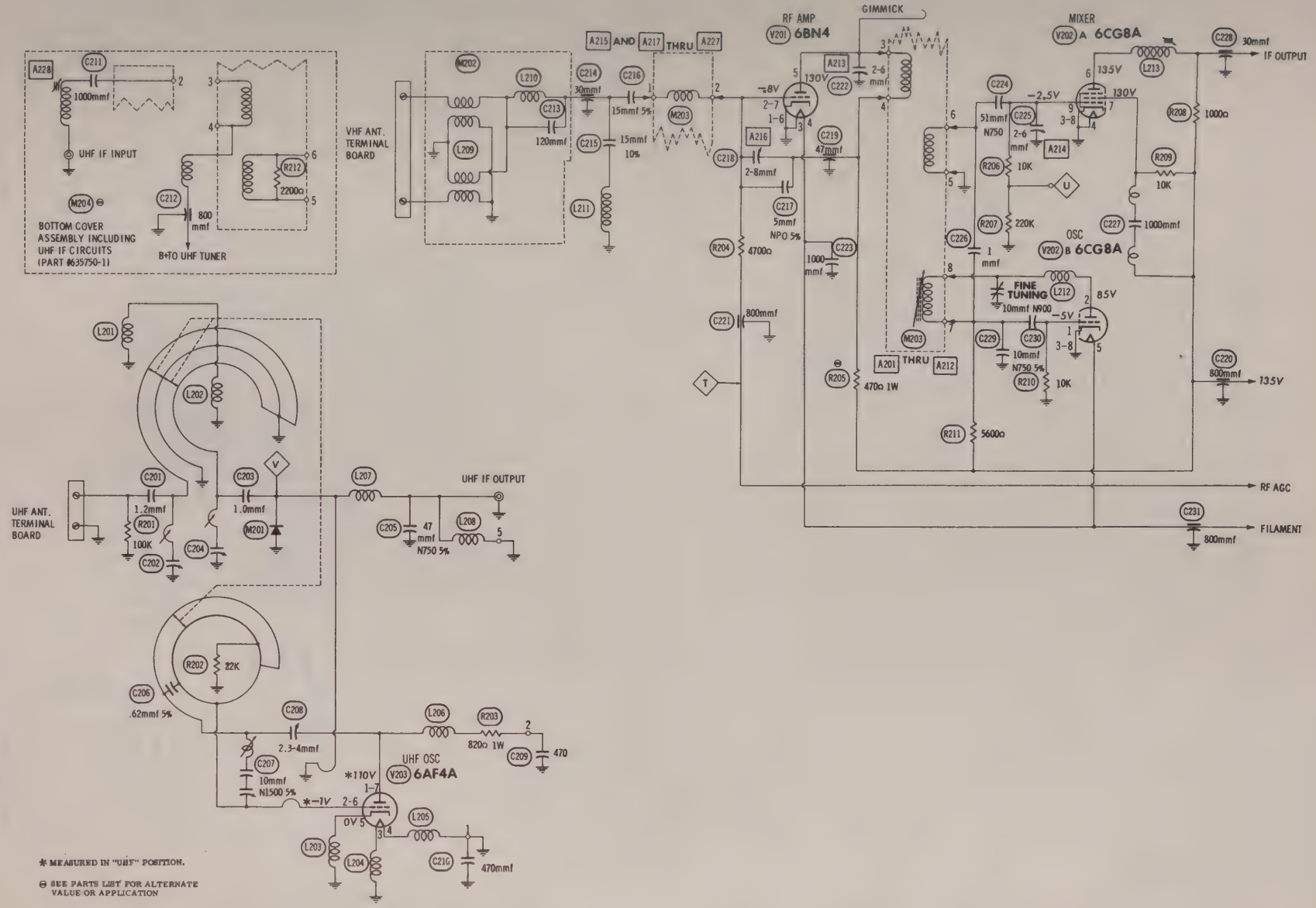


FIG. 1



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

TUNER #700530-3, #700624-1, #700627-1

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
Allow a 20 minute warm-up period for the receiver and test equipment.

RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading. (Approximately 1.5 volts).
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A201, A202	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201.
2.	"	"	"	"	"	Vert. Amp. thru detector (Fig. 202). to plate of 1st. IF tube. Low side to chassis.	A203	Adjust A203 to obtain MINIMUM response on the scope.
3.	"	"	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

OSCILLATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading. (Approximately 1.5 volts).
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across video detector load.	A216	Adjust to place sound marker in trap notch as in Fig. 203. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

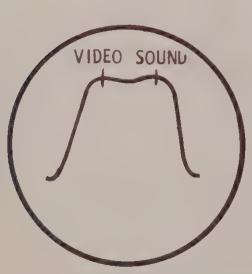


FIG.201

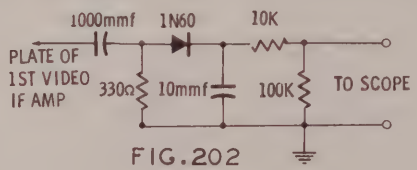


FIG.202

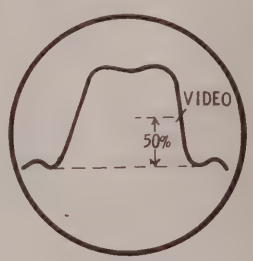
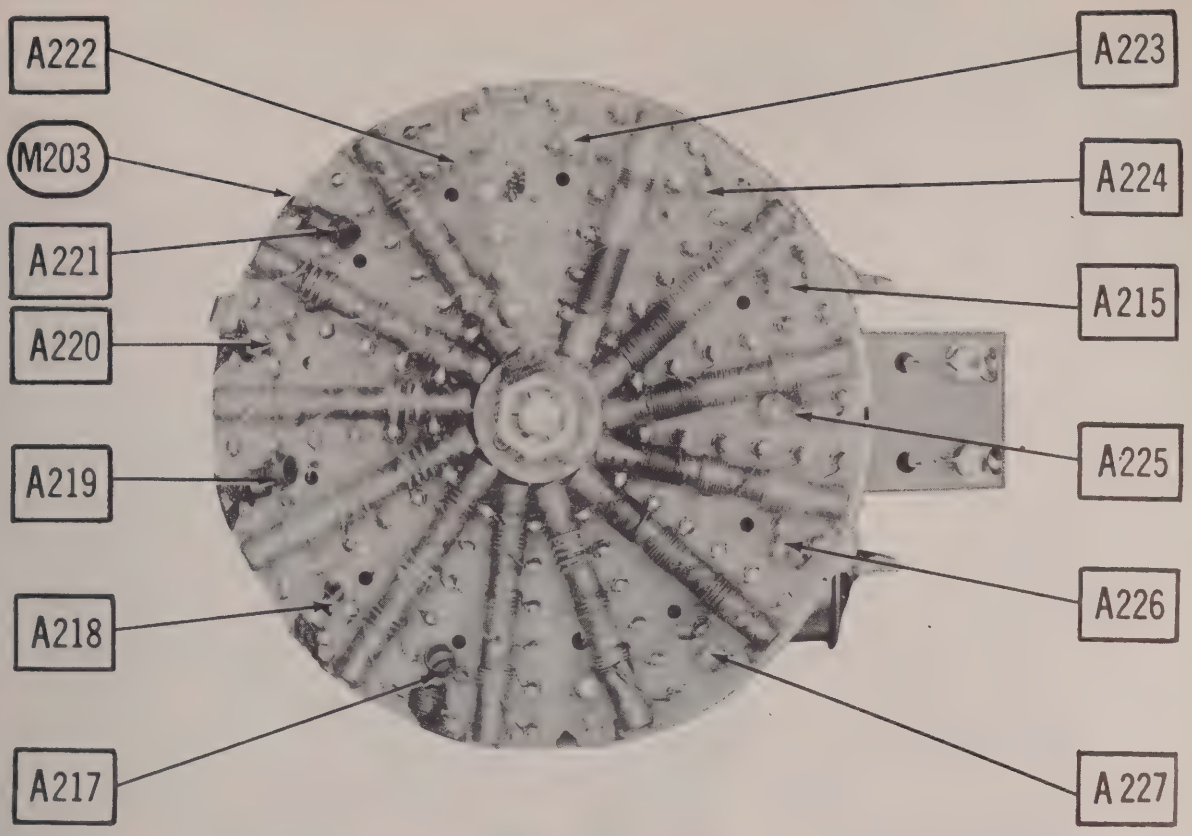
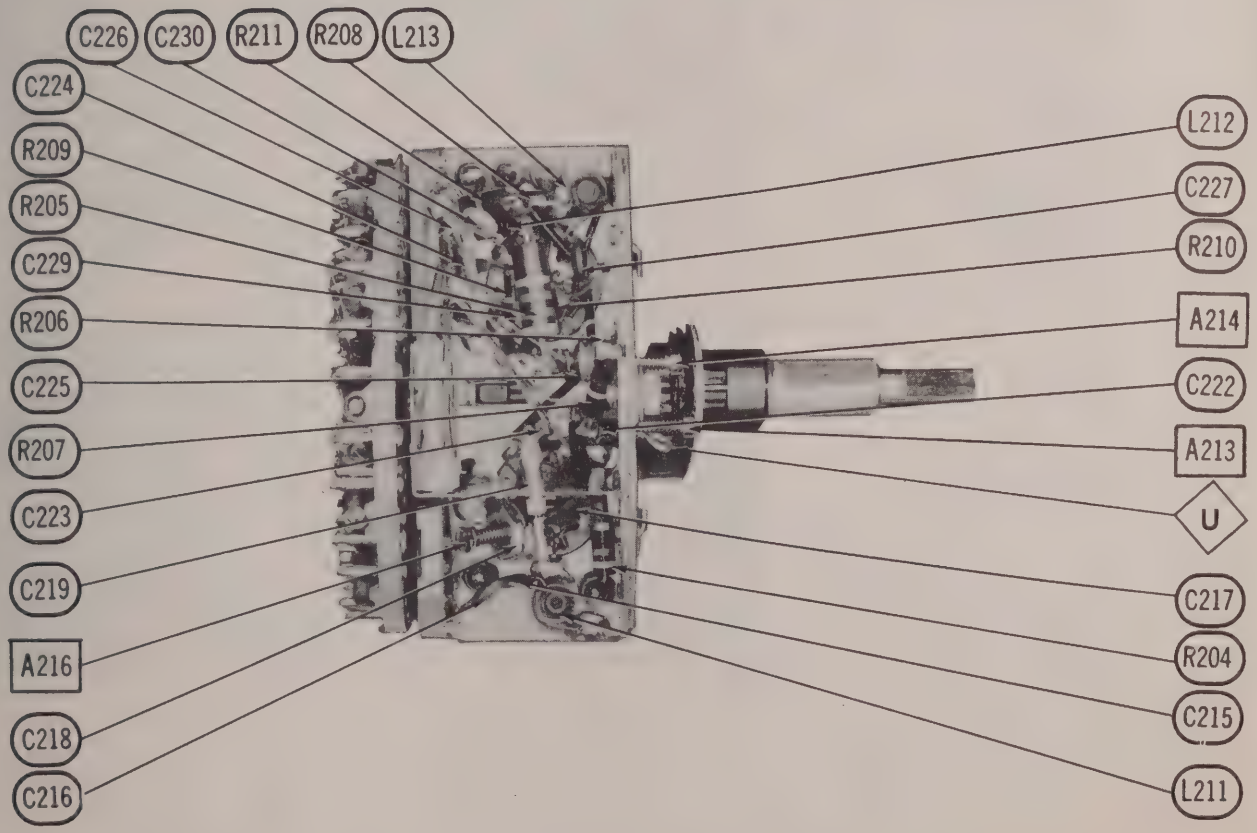


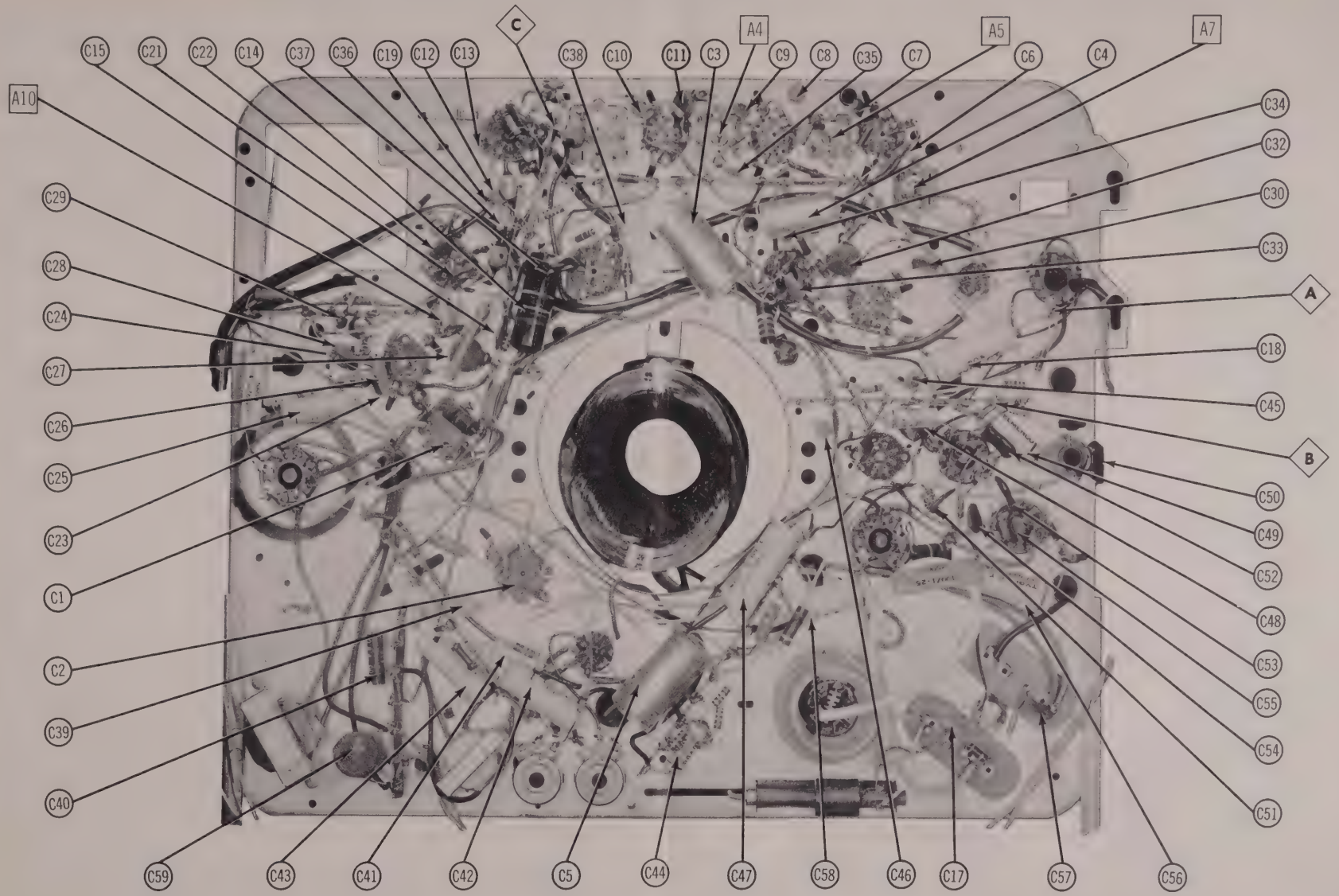
FIG.203



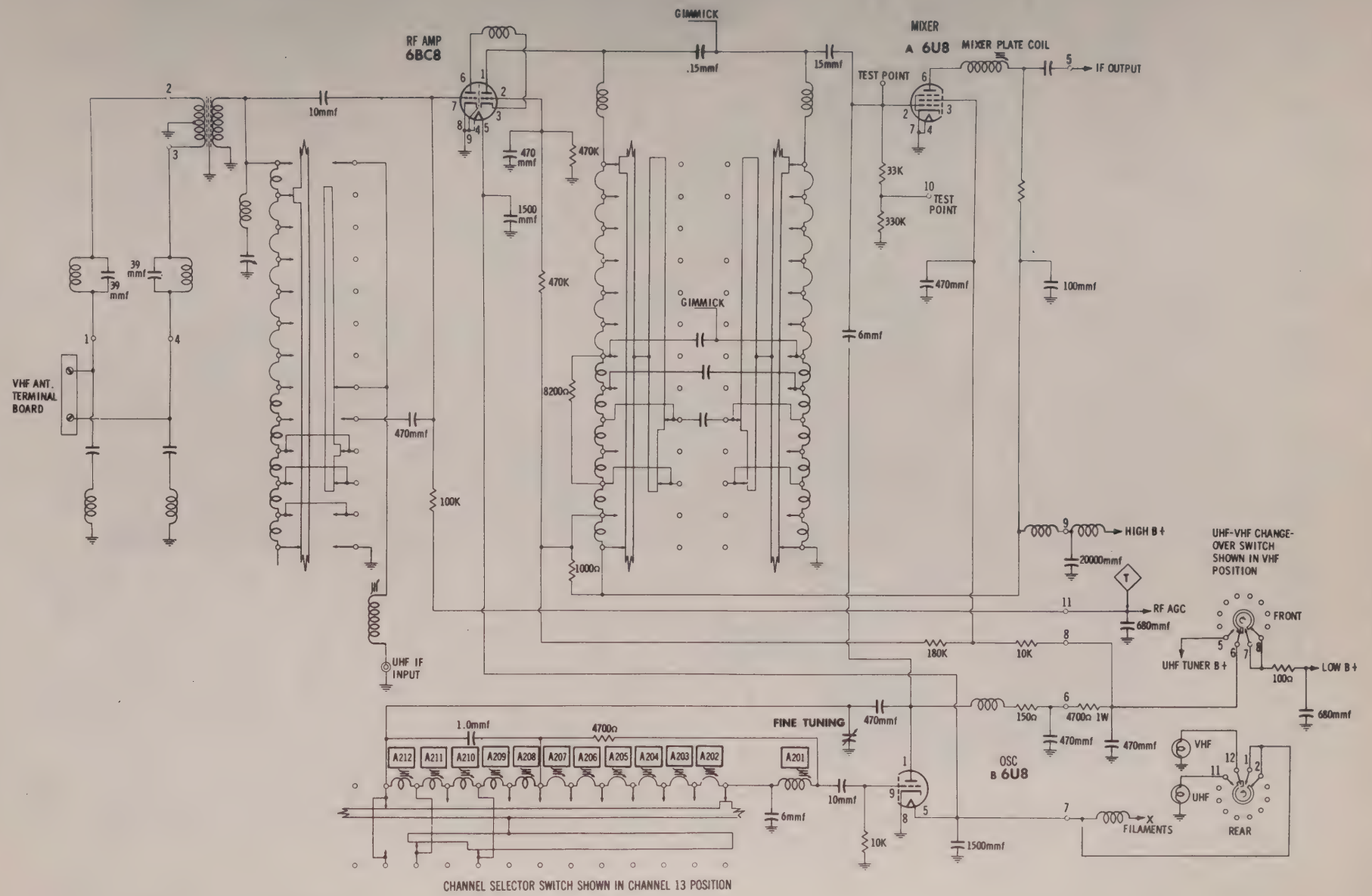
RF TUNER ROTARY ASSEMBLY



RF TUNER BOTTOM VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

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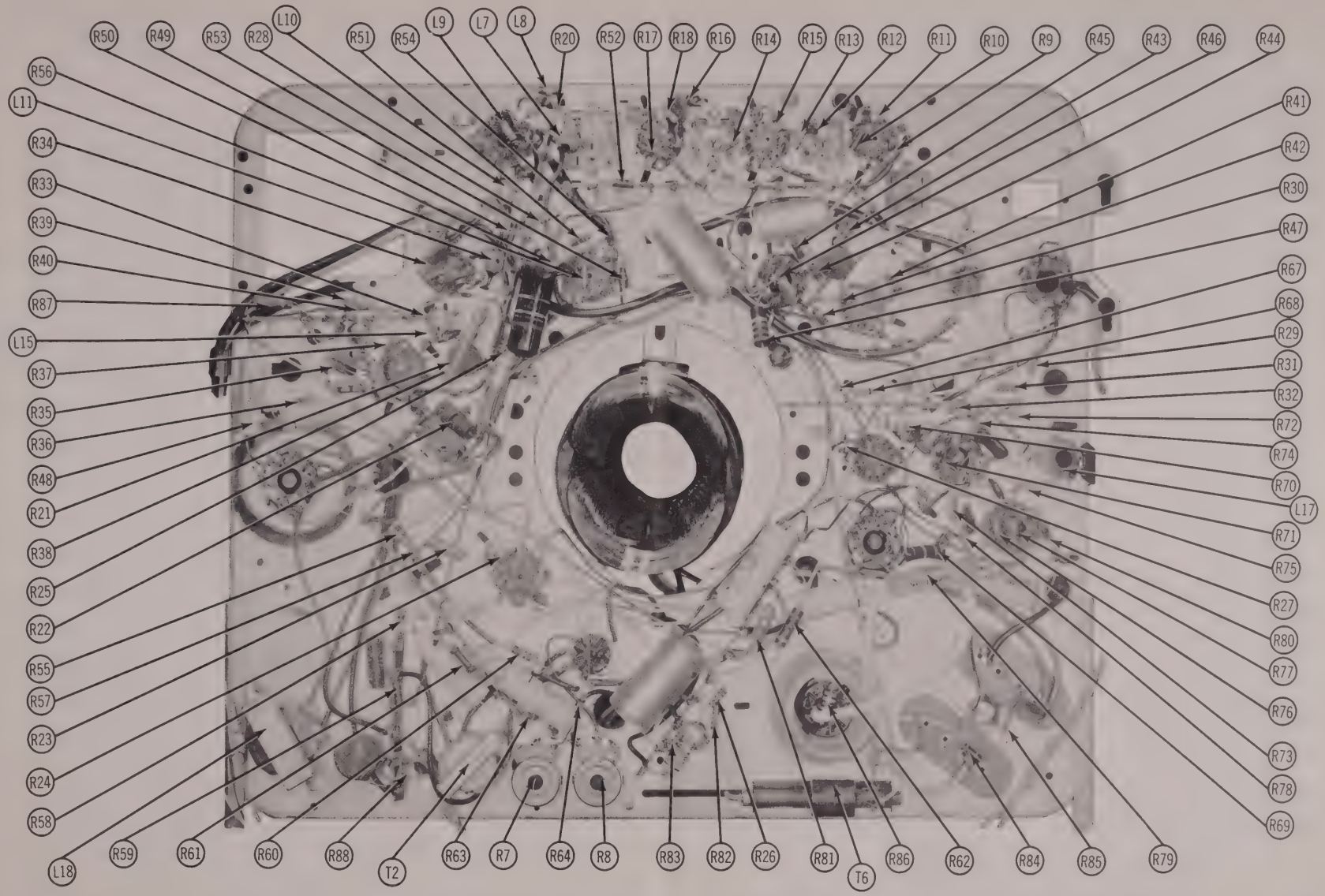
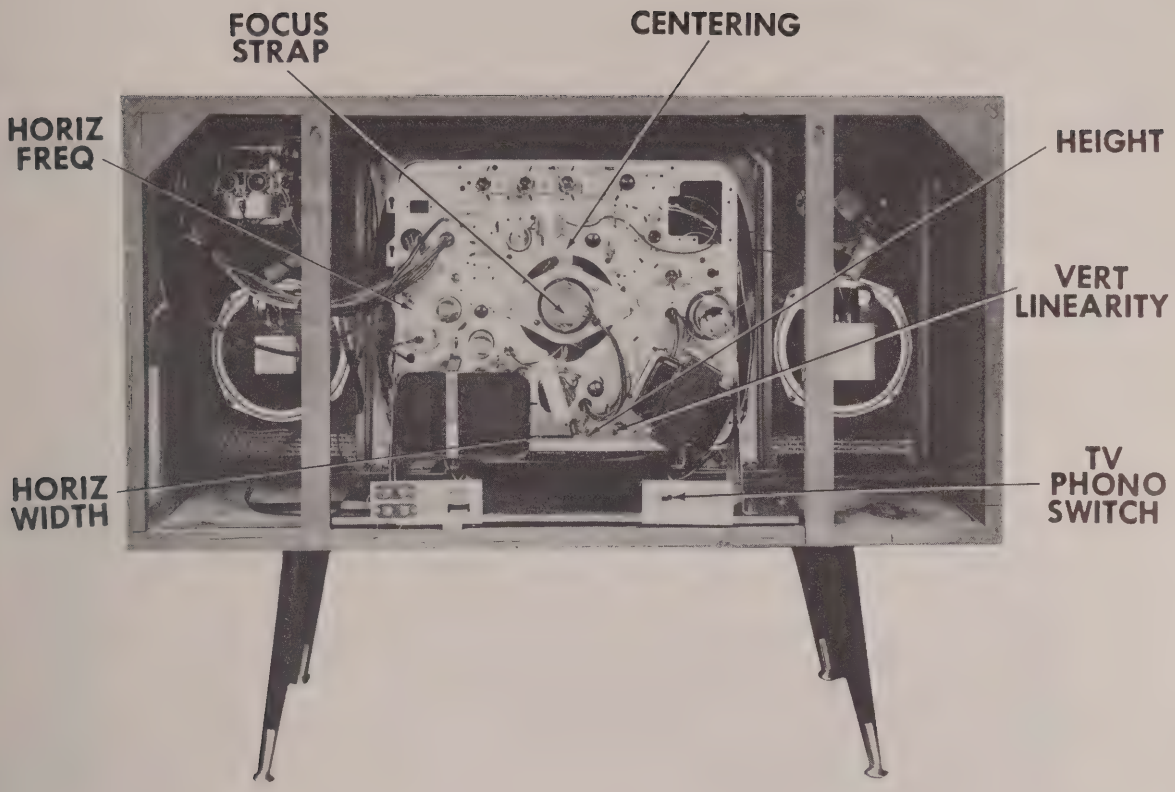
Howard W. Sams & Co., Inc. 1958

UHF-VHF TUNER #700584-6

SPARTAN CHASSIS U25-01AA thru U25-11AA,
V25-01AA thru V25-11AA (25 Series)



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Set the Horizontal Hold control to the center of its range. Adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. Keep turning B1 in the same direction until the picture just falls out of sync. Reverse the direction of rotation until the picture just falls in sync. Rotate the Horizontal Hold control to both extreme ends of rotation. The picture should either stay in sync at both ends of rotation or should fall out of sync by an equal number of bars at each end. If either of these conditions fail to occur, repeat procedure.

Adjust the Width slug for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st. Video IF Amp.	6BZ6	
V2	2nd. Video IF Amp.	6BZ6	
V3	3rd Video IF Amp.	6CB6	
V4	Video Output	12BY7A	
V5	AGC Keying	6AU6	
V6	Sound IF Amp.	6AU6	
V7	Audio Det.	6DT6	
V8	AF Amp. -AGC Clamper	6AT6	
V9	Audio Output	6DG8GT	
V10	Sync Sep. -Sync Phase Inv.	12AU7	
V11	Vert. Osc. -Vert. Output	6CM7	
V12	Horiz. Mult	6SN7GTB	
V13	Horiz. Output	6DQ6A	
V14	Damper	6AX4GT	
V15	HV Rect.	1B3GT	
V16	LV Rect.	5U4GB	

PICTURE TUBE

ITEM No	REPLACEMENT DATA: SPARTAN PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	NOTES
V17	21CBP4, 21CBP4A, 24AEP4		21CBP4-A ①, 24AEP4 ②	21CBP4/, 21CBP4A ①, 24AEP4 ②	① "Silverama" ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP.	VOLT	SPARTAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	350	270021-54	RE1008	D047I	FP43L3 TC47		Q-221.5 MT-4510	TVL-4631
B	40	350							
C	50	50							
D	70	350							
C2A	30	350	270021-54	AFH4-56-93.5	D041S	FP430.33 TC63		T-735 MTD-4508	R2346 *
B	5	350							
C	100	200							
D	20	350							
C3	20	350	270027-20	PR8450V20	BR2035	TC65	TD-20-350	MT-4520	TVA-1608
C4	2	50	270027-22	PR850V2	BBR2-50	TC302	TD-2-50	MT-0503	TVA-1301
C5	20	350	270027-20	PR8450V20	BR2035	TC65	TD-20-350	MT-4520	TVA-1608

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP.	VOLT	SPARTAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	470		250218-6	BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C7	800		250218-14						10%
C8	680		250418-4	BPD-00088	DD-681	BYA10T68	UC-5368	5GA-T68	
C9	800		250218-14						10%
C10	800		250218-14						10%
C11	1500		250218-18	BPD-0015	DD-154	BYA10D15	DC5215	5HK-D15	
C12	12		250246-310			C10Q12C			NPO
C13	680		250418-4	BPD-00088	DD-681	BYA10T68	UC-5368	5GA-T68	
C14	.22	400	250211-15	P488N-22		CUB4P22	GEM-4022	4TM-P22	
C15	10000		250218-19	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	①
C16	100		250175-59	NPO-DI 100	D1Z-100	C10T1C	ZT-531	5TCC-T1	NPO
C17	1000	2000	250175-47	HVD-30-1000	DD30-102	HVB20D1	DC3021	20HKB-D1	
C18	.22	200	250202-15	P288N-22		CUB2P22	GEM-2022	4TM-P22	
C19	2.2		250221-118		TCZ-2R2				10%
C20	100		250175-39	NPO-DI 100	D1Z-100	C10T1C	ZT-531	5TCC-T1	NPO
C21	3900		250175-31		DD-392	L10D39			
C22	5000		250175-1	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C23	470		250218-6	BPD-00047	DD-471	BYA10Q47	UC-5347	5GA-T47	
C24	18		250175-54						N150
C25	.047	200	250204-11	P488N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C26	10000		250218-19	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C27	10000		250218-19	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C28	10000		250175-4	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C29	220			DI-220	D1-221	L10T22	UC-5322	5GA-T22	④
C30	5000		250175-30	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C31	5000		250175-30	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C32	10000		250175-2	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C33	5000		250175-30	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C34	470		250218-6	BPD-00047	DD-471	BYA10Q47	UC-5347	5GA-T47	
C35	680		250218-4	BPD-00068	DD-680	BYA10Q68	UC-5368	5GA-T68	①
C36	.0022	400	250211-3	P488N-0022	DF-223	CUB4S22	GEM-4222	4TM-D22	
C37	150		250229-534	1468-00015	D1-151	5WST15	MC-336	1FM-315	
C38	.1	400	250211-13	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C39	10000		250218-19	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C40	.0051	400	250218-13						5%
C41	.0047	400	250211-5	P488N-0047	DF-472	CUB6D47	GEM-6247	6TM-D47	
C42	.1	400	250411-13	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C43	.047	400	250213-7						10%
C44	.0033	800	250401-4	P888N-0033	D8-332	CUB6D33	GEM-6233	6TM-D33	
C45	1000		250218-8	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C46	1000		250218-8	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C47	.1	800	250201-13	P888N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C48	.0047	400	250212-4	P488N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C49	.047	400	250213-5						10%
C50	3900		250236-468	1464-0039		1R5D39		MS-339	10%
C51	1000		250218-8						10%
C52	360		250249-343	1469-00036		5R5T36		MS-336	5%
C53	470		250249-346	1469-00047		5R5T47		MS-347	5%
C54	1000		250236-6	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	①
C55	1000		250218-8						10%
C56	.047	400	250211-11	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C57	68	4000	250175-42				HVAJ0Q68	20GA-Q68	10% ①
C58	.047	400	250211-11	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C59A	10000		250419-3	BPD-AX01	DD3-103	BYD6S1	DC511	5HK-S21	
B	10000						DC511		

① Not used in some versions.
② Ch. U/V25-07AA use 100mmf in this application (Part #250218-22).

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	SPARTAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	220135-1					Volume
B	Switch							
R2A	600Ω	½	240146-56	B-415		Q17-105	U751R	Contrast
B	Shaft			Not Req.		Not Req.	Not Req.	
R3A	500K	½	220132-4	B-80	A47-500K-Z	Q13-133	TA55A	Tone
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
R4A	1.5meg	½	220132-13	B-742	A47-1.5meg -S	Q11-138	TA55L	Vert. Hold
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
R5A	2.5meg	½	220146-4	AB-83	A47-2.5meg -S	Q11-139	TA55L	Vert. Height
B	Shaft			AK-1	FK3-1/4	SK3	Not Req.	
R6A	100K	½	220132-2	B-46	A47-200K-S	B11-149	U43	Brightness
B	Shaft			Not Req.	KS8-3	SK3	Not Req.	
R8A	50K	½	220132-1	B-31	A47-50K-S	Q11-123	TA54L	Horiz. Hold
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
R7A	3000Ω	½	220146-5	AB-8	A47-3000-S	B11-128	PTA352L	Vert. Lin.
B	Shaft			AK-1	FK3-1/4	SK3	Not Req.	
R9A	2.5meg	½	220146-4	AB-83	A47-2.5meg -S	B11-138	TA55L	Vert. Height
B	Shaft			AK-1	FK3-1/4	SK3	Not Req.	

CONTROLS (cont)

ITEM No	RATING: RESISTANCE	WATTS	SPARTAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R8A	100K	½	220132-2	B-46	A47-200K-S	B11-149	U43	Brightness
B	Shaft			Not Req.	KS8-3	SK3	Not Req.	
R8A	50K	½	220132-1	B-31	A47-50K-S	Q11-123	TA54L	Horiz. Hold
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
R7A	3000Ω	½	220146-5	AB-8	A47-3000-S	B11-128	PTA352L	Vert. Lin.
B	Shaft			AK-1	FK3-1/4	SK3	Not Req.	
R9A	2.5meg	½	220146-4	AB-83	A47-2.5meg -S	B11-138	TA55L	Vert. Height
B	Shaft			AK-1	FK3-1/4	SK3	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	SPARTAN PART No.	NOTES
R9	2400Ω 5%		230094-168	Note 1
R10	1500Ω			Note 3
R11	47Ω		230104-46	
R14	22K 5%		230094-191	
R13	1800Ω			Note 2
R14	1500Ω			Note 4
R15	47Ω		230104-46	
R16	47K		230104-82	
R17	1500Ω			Note 2
R18	120Ω		230104-51	
R19	470Ω		230104-58	
R20	33000Ω 5%		230094-173	
R21	4300Ω 5%	5	240073-1	
R22	1000Ω	2	230106-52	
R23	22K	1	230105-78	
R24	22K		230104-78	
R25	470K		230104-91	
R26	470K		230104-91	
R27	47K		230104-82	
R28	33K		230104-80	
R29	820K 5%		230094-229	
R30	9.1meg 5%		230094-254	
R31	330K 5%		230094-219	
R32	56K 5%		230094-201	
R33	12K		230104-75	
R34	220Ω		230104-54	
R35	270K		230104-91	
R36	560K		230104-95	
R37	6800Ω		230104-72	
R38	680Ω		230104-80	
R39	470K		230104-94	
R40	33K		230104-80	
R41	4.7meg		230106-106	
R42	330K		230104-94	Note 3
R43	1meg 5%		230094-231	
R44	1.5meg 5%		230094-233	
R45	1meg		230104-98	
R46	3300Ω		230104-68	
R47	22Ω	2	230108-55	
R48	5600Ω 5%	7	240076-43	Note 4
R49	10K		230104-74	
R50	470K		230104-94	
R51	4.7meg		230104-106	
R54	1meg		230104-98	
R55	33000 5%		230094-171	
R56	33000 5%		230094-171	
R57	100K		230104-86	
R58	100K		230104-86	
R59	2meg 5%		230094-238	
R60	22K		230106-78	
R61			230130-2	Note 5
R62	1meg	1	230105-98	
R63	11K 5%		230094-184	
R64	1000Ω		230104-52	
R65	270Ω		230104-55	
R66	270Ω		230104-55	
R67	100K		230104-86	
R68	100K		230104-86	
R69	18Ω	2	230106-41	
R70	470K		230104-94	
R71	4.7meg		230104-106	
R72	68000 5%		230094-179	
R73	12000 5%		230094-182	
R74	100K 5%		230094-207	
R75	120K 5%		230094-209	
R76	6800Ω		230094-18	Note 4
R77	4700Ω		230104-70	Note 6
R78	470K		230104-94	
R79	8500Ω 5%	5	270071-25	
R80	15Ω		230104-40	Note 4
R81	3300Ω	1	230105-58	
R82	470K		230104-91	
R83	470K		230104-91	
R84	8200Ω		230104-73	Note 4
R85	8200Ω		230104-73	Note 7
R86	3.9Ω		230107-3	
R87	680Ω	2	230104-60	
R88	120K		230110-1	

Note 1. Ch. U/V25-01AA, -02AA, -03AA, -04AA, -05AA, -08AA, -07AA use 3600Ω 5% (Part #230094-172).
Ch. U/V25-08AA, -09AA, -10AA use 3000Ω 5% (Part #230094-170).
Note 2. Some versions may use 1000Ω in this application (Part #230104-62).
Note 3. Some versions may use 270K in this application (Part #230104-91).
Note 4. Not used in some versions.
Note 5. Temperature Compensating. Do not measure.
Note 6. Some versions use 12K in this application (Part #230104-75).
Note 7. Some versions use 2700Ω in this application (Part #230094-87).

TRANSFORMER (POWER)

ITEM No.	RATING: PRI	SEC. 1	SEC. 2	SPARTAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ①1.57A ②.240A	560VCT ③ 5A	5VAC ④ 3A	300083-1		P-307T①			26R90 ①	R-56BC①
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC ④ 8.5A									

① Use original mounting brackets.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	SPARTAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	Vert. Osc.	320262-2	B6702	A-3003	V406	VBO201	26A04	A-124X	
T3	Vert. Output	320278-1							
T4A	Yoke-Horiz.(21MH)	360617-1	DF612 ①	MDF-92 ①	Y90F18/43 ①	DY-16A①	Y-16 ①	Y-41 & NW22	
B	(90°)-Vert.(45MH)			-					
M9	Rear Cover & Centering Device	360738-1						YC-1	
T5	Horiz. Output	360700-2			X152 * X152 ②	A-8295 * A-8295 ②		D-92 * D-93 ②	
	Alt. Horiz. Output	360700-1							
T6	Width Coil (7-22MH)	360699-1		MWC-12 ③	30R3A ①	WC-18	WC-19 ③	WLC-3 ③	

① Use original yoke damping network and original rear cover and centering device.
② When replacing horizontal output (Magnavox Part #360700-1), refer to alternate horizontal output circuit.
③ Drill new mounting hole.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8			8	8		8
5			5	5		5
3			3	3		3
2			2	2		2
1			1	1		1
Connect Width Coil Across	4 & 1		2 & 1	2 & 1		4 & 1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	SPARTAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T7	2000Ω	3-4Ω	320279-1	Z1105 ①	A-3018	AU-600	A-3823	46B50	S-16X ①	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	SPARTAN PART No.	QUAM PART No.	NOTES
SP1	8"	PM	8-8Ω	583765	8A312S	
SP2	8"	PM	4-8Ω	583865	8A425-6	
SP3	4"	PM	4-8Ω	583779-1	4A07	
SP4	4"	PM	4-8Ω	583779-1	4A07	

COILS (RF-IF)

ITEM No.	USE	SPARTAN PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	RF Choke		19-1000	BC-561	4602		1 Microhenry, IRC Part #CLA
L2	RF Choke		19-1000	BC-561	4602		1 Microhenry
L3	1st. Video IF	360654-1					Includes 41.25MC Trap
L4	2nd. Video IF	360644-					Includes 47.25MC Trap
L5	3rd. Video IF	360644-1					Includes 47.25MC Trap
L6	4th. Video IF	360643-1	17-4614				Complete assy.
L7	Shunt Peaking Coil	360622-16	19-3300	TV-198	6130		276 Microhenries
L8	RF Choke	360643-23	19-1004	BC-585	4610		6 Microhenries
L9	Cathode Choke	360630-1	19-1001	BC-562	4604	VP-9	1.65 Microhenries ①
L10	Series Peaking Coil	360622-14	19-3078 *	TV-186 *	6172 *	VP-2 *	75 Microhenries, wound on 820Ω resistor
L11	Shunt Peaking Coil	360622-9	19-3250	TV-185	6181	VP-6	235 Microhenries
L12	4.5MC Trap	360714-1					
L13	Series Peaking Coil	360622-13	19-3100 ▲	TV-194 ▲	6112 ▲	VP-3 ▲	100 Microhenries, wound on 10K resistor
L14	1st. Sound IF	360714-1					
L15	2nd. Sound IF	360715-1				80-5 ♦	
L16	Quadrature Coil	360718-1					

① Not used in Ch. U/V25-01AA, -02AA, -03AA, -08AA, -09AA.
* Parallel with 820Ω resistor.
▲ Parallel with 10K resistor.
♦ Remove C24 (18mmf).

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	SEC.	SPARTAN PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L17	53Ω		360579-1	19-1576	TV-163	6210	H-102	HS-5	

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES	INDUCTANCE @ CURRENT 1000 ^C.)	SPARTAN PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
L18	235A	35Ω	45 Hy.	320058-3	C5040 ①	C-2974 ①		C-2326 ①	28C41 ①	C-2761 ①

① Drill new mounting hole.

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	SPARTAN PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1		330045-2 ①	1215 ①②		1T1 ①③		① Selenium type. ② Two required.

FUSES

ITEM No.	TYPE	RATING	SPARTAN PART No. FUSE	SPARTAN PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No FUSE	BUSS PART No HOLDER
M2	N	1/4A 250V S/B	180590-3		333.250 (N 1/4A 125V S/B)	346008	N 1/4	HN 0 to 3/4

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	SPARTAN PART No.	CBS PART No.	SYLVANIA PART No	NOTES
M3	1N60 *		1N60	1N60	Video Det (Pigtail) * Some versions may use a 1N64 in this application.

MISCELLANEOUS

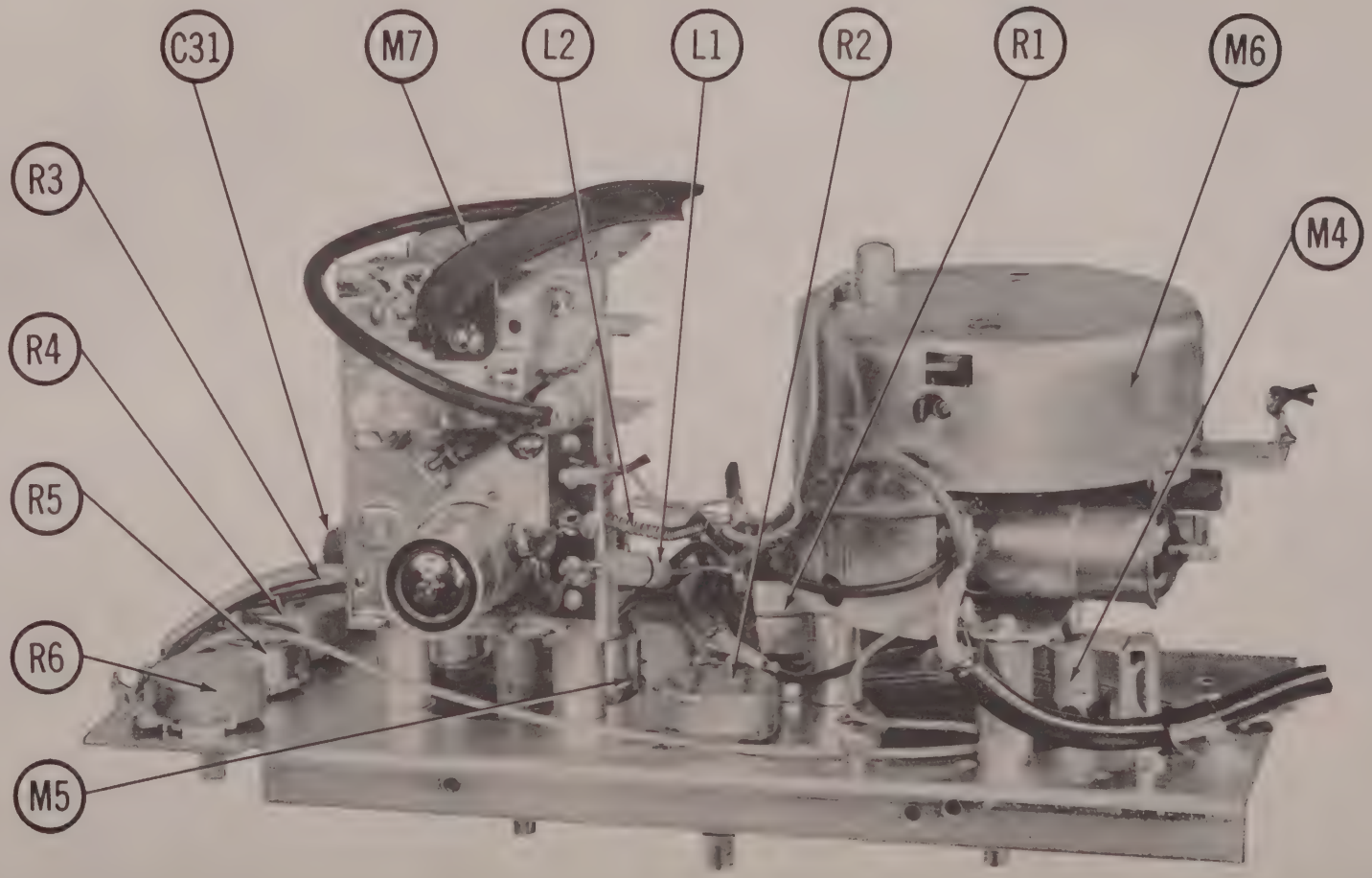
ITEM No.	PART NAME	SPARTAN PART No.	NOTES
M4	Lamp		Channel Indicator #47
M5	Lamp		Channel Indicator #47, UHF only
M6	Tuner	700627-1	UHF-VHF, Ch. U25-08AA, -09AA, -10AA, -11AA
	Tuner	700584-6	UHF-VHF, Ch. U/V25-01AA, -02AA, -03AA, -04AA, -05AA, -06AA, -07AA
	Tuner	700624-1	VHF, Ch. V25-08AA, -09AA, -10AA, -11AA
M7	Tuner	700630-3	UHF, Ch. U25-01AA thru U25-11AA
M8	Switch	160229-1	Phono-TV, Slide Type
M9	Centering Device	360738-1	Includes yoke rear cover
M10	Trap	380492-8	Sutvets (UHF only)

WIRING DATA

High Voltage Lead	Use BELDEN No. 8969
Shielded Hook-up Wire	Use BELDEN No. 8585 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

SPARTAN CHASSIS U25-01AA thru U25-11AA, V25-01AA thru V25-11AA (25 Series)

FOLDER 2



TUNER & CONTROL BRACKET

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS FOR TUNER #700584-6

Allow a 20 minute warm-up period for the receiver and test equipment.

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point ⊕. Positive to chassis.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across video detector load.	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A202	
			201MC	199.25MC 203.75MC	11		A203	
			195MC	193.25MC 197.75MC	10		A204	
			189MC	187.25MC 191.75MC	9		A205	
			183MC	181.25MC 185.75MC	8		A206	
			177MC	175.25MC 179.75MC	7		A207	
			85MC	83.25MC 87.75MC	6		A208	
			79MC	77.25MC 81.75MC	5		A209	
			69MC	67.25MC 71.75MC	4		A210	
			63MC	61.25MC 65.75MC	3		A211	
			57MC	55.25MC 59.75MC	2		A212	

VHF RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

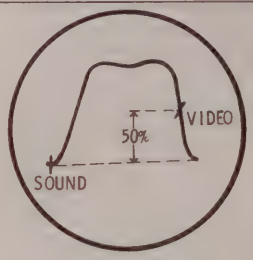
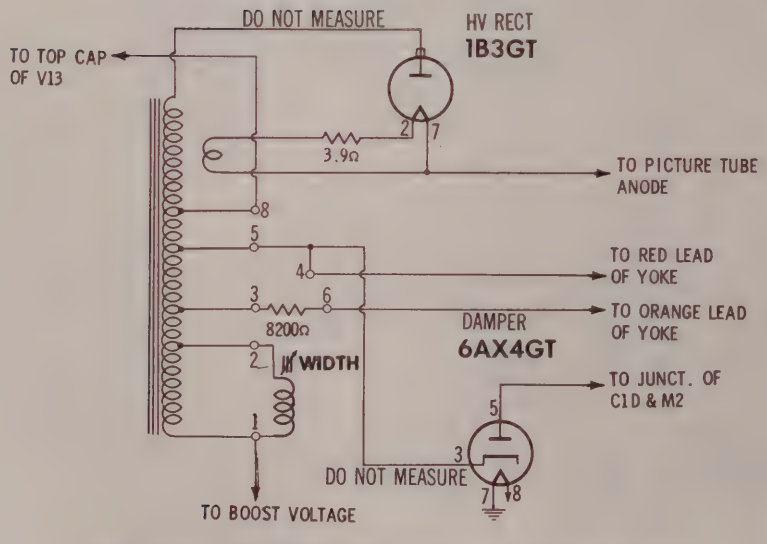


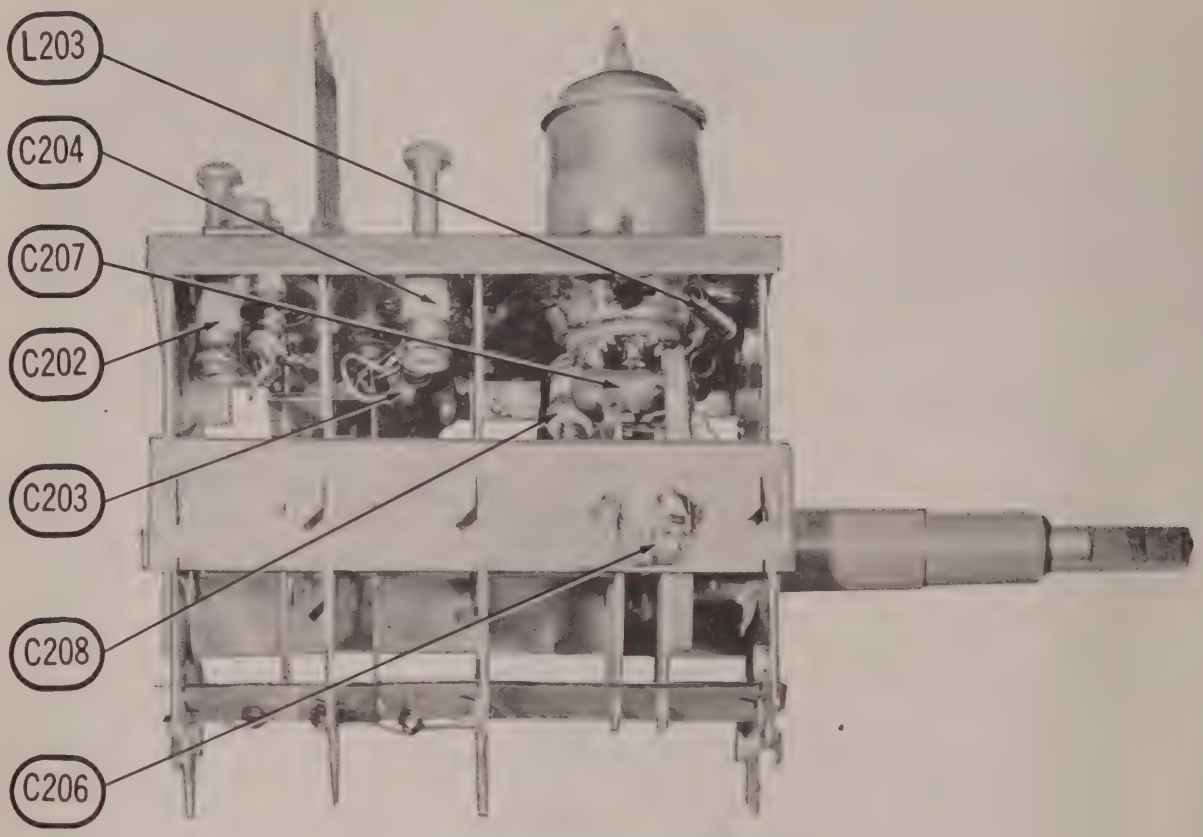
FIG. 201



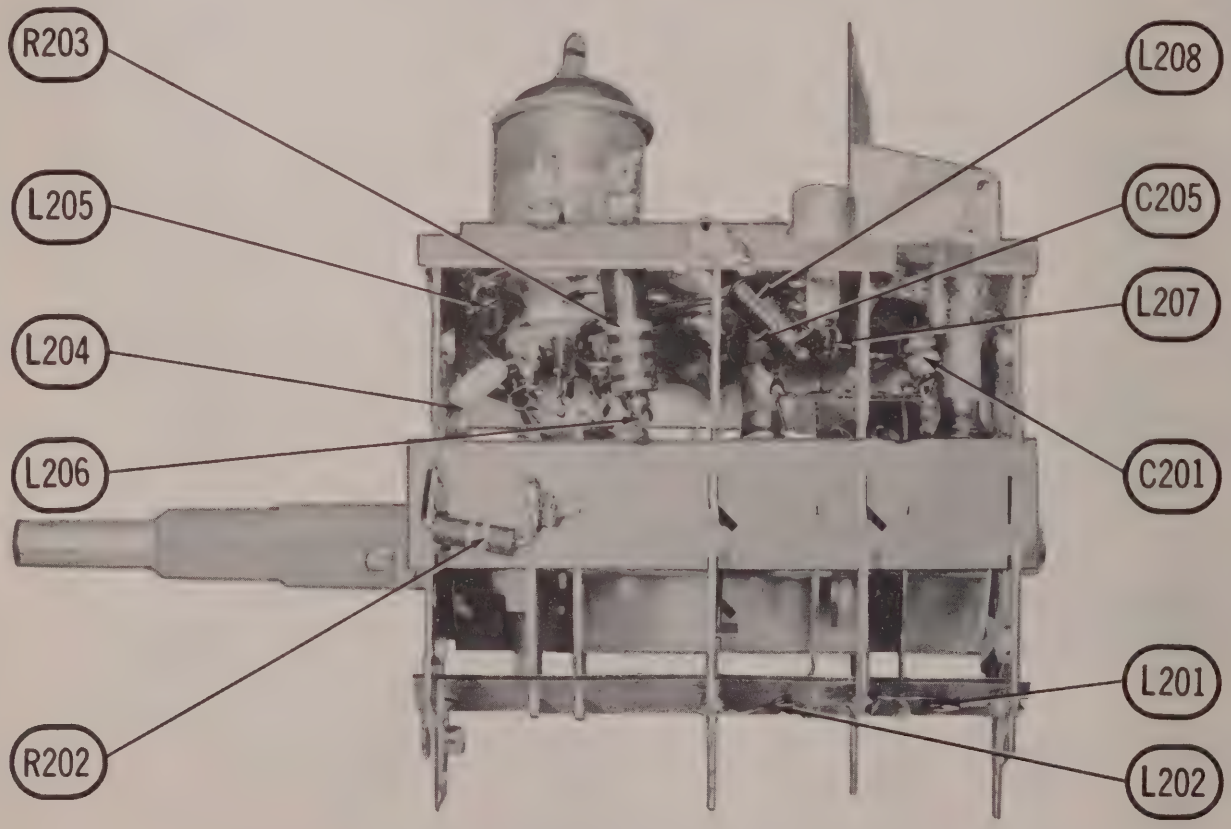
HORIZ OUTPUT TRANSFORMER PART #360700-1 USED IN SOME VERSIONS

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

ALTERNATE HORIZONTAL SWEEP CIRCUIT



UHF TUNER-LEFT SIDE



UHF TUNER-RIGHT SIDE

TUNER ALIGNMENT INSTRUCTIONS (cont)

UHF IF ALIGNMENT

Connect bias as under "VHF Oscillator Alignment".
Set the Local-Distant switch to "Local" position and contrast control fully counter clockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	1000Ω Carbon Resistor	High side to point (V). Low side to tuner chassis.	43.0MC (10MC Swp)	42.25MC 45.75MC	UHF	Vert. Amp. thru 10K across video detector load.	A228	Adjust for response curve similar to Fig. 205 with MINIMUM tilt.

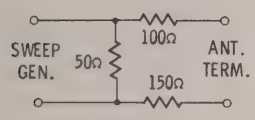


FIG 201

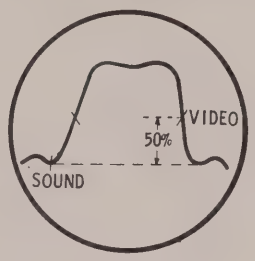


FIG. 202

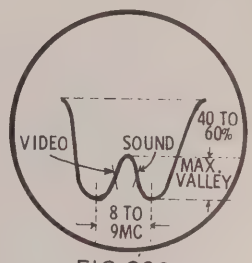


FIG. 203

FIG. 204

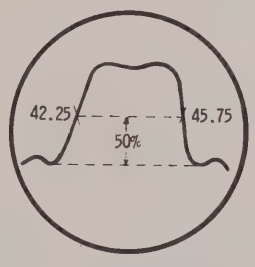
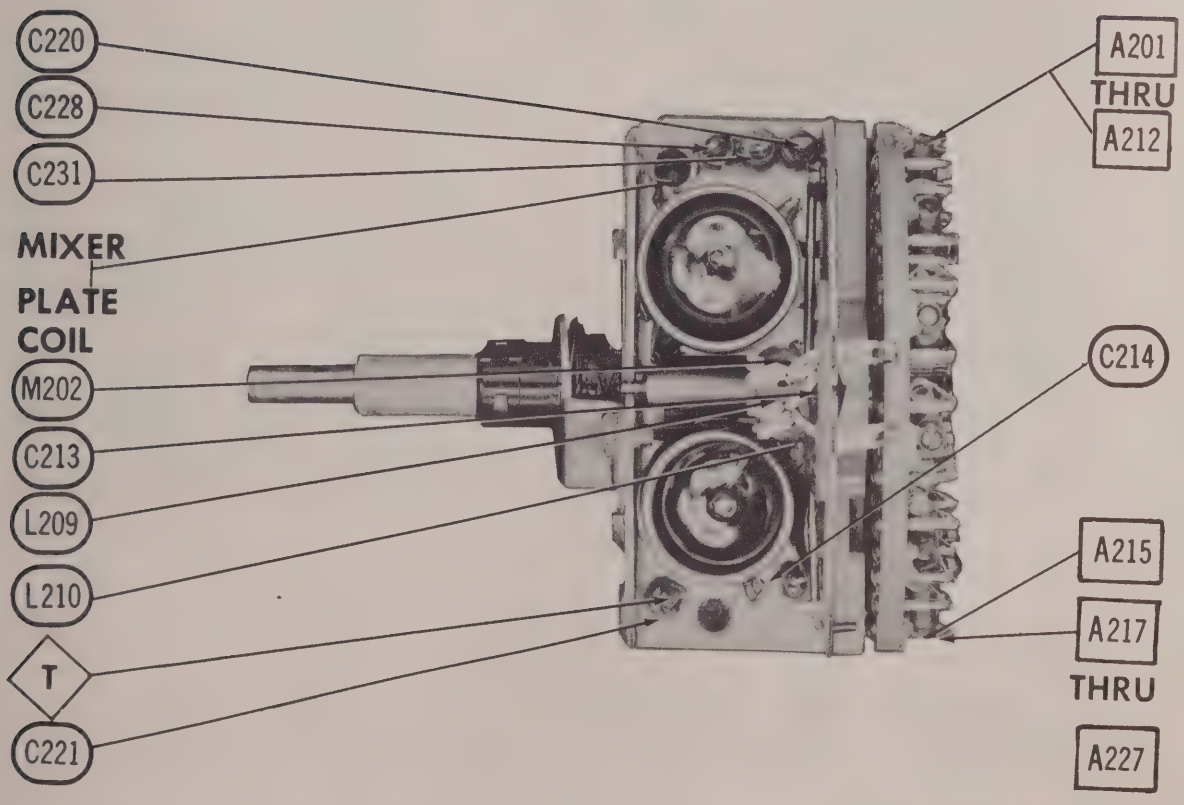


FIG. 205



RF TUNER—TOP VIEW

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amplifier	6BN4	
V202	Mixer-Osc.	6CG8A	

ITEM No.	USE	TYPE	NOTES
V203	UHF Osc.	6AF4A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SPARTAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	1.2		250221-115	NPO-SI 1.0	TCZ-1		TCO-1		5TCCB-V1	
C202			250188-10							
C203	1.0		250221-114	NPO-SI 1.0	TCZ-1		TCO-1		5TCCB-V1	
C204			250188-10							
C205	47		250175-21		TCN-47		TC7-47			N750 5%
C206	.62		250221-1001							5%
C207	10		250088-140							N1500 5%
C208	2.3-4		250220-2							
C209	470		250175-8	BPD-00047	DD-471	L10T47	ED-470	UC-5347	5GA-T47	
C210	470		250175-8	BPD-00047	DD-471	L10T47	ED-470	UC-5347	5GA-T47	
C211	1000		250272-1	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C212	800		250266-1							
C213	120		250262-1	BPD-00012	DD-121	L10T12	ED-120	UC-5312	5GA-T12	
C214	30		250263-1							
C215	15		250264-1	NPO-D1 15	DD-150	L10Q15	ED-15		5TCC-Q15	10%
C216	15		250265-1		TCZ-15		TCO-15			5%
C217	5		250274-1		TCZ-4R7		TCO-5			NPO 5%
C218	2-8		260145-1							
C219	47		250273-1							
C220	800		250266-1							
C221	800		250266-1							
C222	2-8		260144-1							
C223	1000		250272-1	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C224	51		250267-1							N750
C225	2-6		260144-1							
C226	1.0		250268-1	NPO-SI 1.0	TCZ-1		TCO-1		5TCCB-V1	
C227	1000		250271-1	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C228	30		250263-1							
C229	10		250270-1		TCN-10		TC7-10			N750 5%
C230	10		250269-1							N900
C231	800		250266-1							

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		SPARTAN PART No.	NOTES
	OHMS	WATT		
R201	100K		230104-86	
R202	22K		230104-78	
R203	820Ω	1	230145-61	
R204	4700Ω		230104-70	
R205	470Ω	1	230105-62	Note 1
R206	10K		230104-74	

ITEM No.	RATING		SPARTAN PART No.	NOTES
	OHMS	WATT		
R207	220K		230104-90	
R208	1000Ω		230104-62	
R209	10K		230104-74	
R210	10K		230104-74	
R211	5600Ω		230104-71	
R212	2200Ω		230104-66	

Note 1. VHF tuner #700624 uses 1000Ω 1W (Part #230105-62) in this application.

COILS (RF-IF)

ITEM No.	USE	SPARTAN PART No.	NOTES
L201	RF Choke	360574-30	
L202	RF Choke	360574-30	
L203	Cathode Choke	360522-7	
L204	Fil. Choke	360574-8	
L205	Fil. Choke	360574-8	
L206	RF Choke	360574-8	
L207	RF Choke	360574-12	

ITEM No.	USE	SPARTAN PART No.	NOTES
L208	RF Choke	360574-50	
L209	VHF Ant.Trans.	360744-1	
L210	IF Trap	360740-1	
L211	IF Trap	360741-1	
L212	Osc. Coil	360742-1	
L213	Mixer Plate Coil	360743-1	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SPARTAN PART No.	CBS PART No.	SYLVANIA PART No.	
M201		530036-1	1N82A	1N82A	UHF Mixer (Clip-in)

MISCELLANEOUS

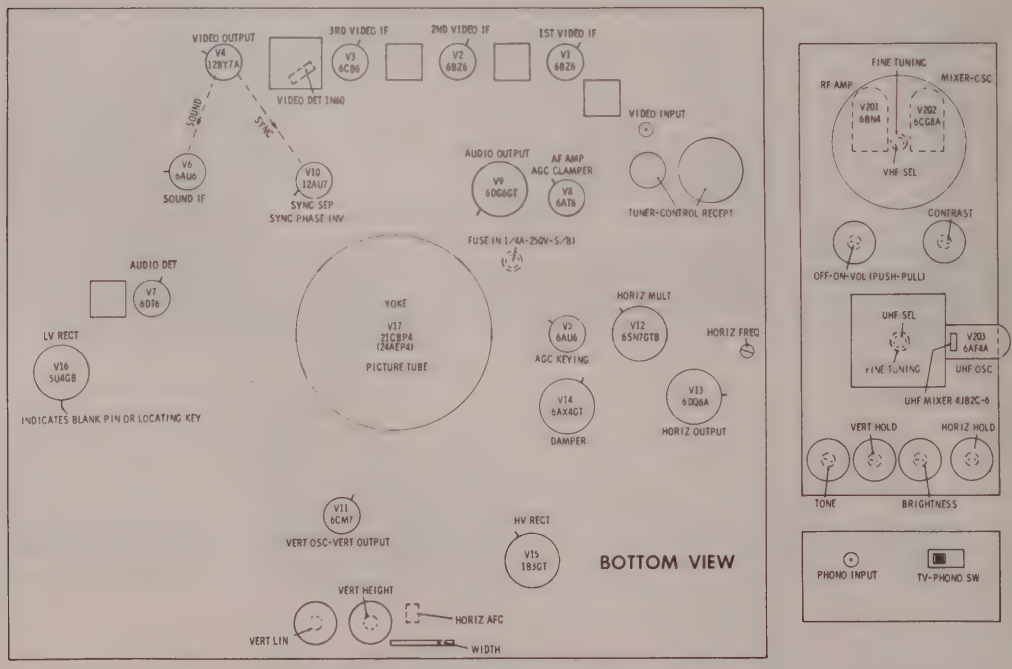
ITEM No.	PART NAME	SPARTAN PART No.	NOTES
M202	Ant. Network	460921-1	Includes L209, L210, C213
M203	Rotor Assy.	160283-1	Complete, includes shaft
M204	Rear Cover Assy.	635750-1	Includes coils, caps and contacts UHF-VHF tuner part #700627
	Rear Cover Assy.	635749-1	VHF tuner part #700624
	Extension Contact	635751-1	UHF connections on rotor
	Osc. Slug	110375-1	12 used
	Spring Contact	635748-1	Stator (7 used)

CHASSIS TOP VIEW

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	58K	47Ω	.1Ω	0Ω	▪ 1500Ω	▪ 1500Ω	0Ω		
V2	6BZ6	57K	47Ω	.1Ω	0Ω	▪ 1500Ω	▪ 1500Ω	0Ω		
V3	6CB6	.1Ω	120Ω	.1Ω	0Ω	▪ 1500Ω	▪ 1500Ω	0Ω		
V4	12BY7A	160Ω	3900Ω	0Ω	.1Ω	.1Ω	0Ω	†5300Ω	▪ 11K	0Ω
V5	6AU6	†20K	†1000Ω	.1Ω	0Ω	350K	‡3300Ω	†1000Ω		
V6	6AU6	1.2Ω	0Ω	.1Ω	0Ω	▪12K	▪ 12K	220Ω		
V7	6DT6	3.7Ω	680Ω	.1Ω	0Ω	†270K	▪ 6800Ω	560K		
V8	6AT6	4.7meg	0Ω	0Ω	.1Ω	1.1meg	NC	†330K		
V9	6DG6GT	TP	0Ω	†390Ω	†3500Ω	500K	TP	.1Ω	20K(MIN)	
V10	12AU7	†1meg	4.7meg	0Ω	0Ω	0Ω	†4000Ω	22K	3300Ω	.1Ω
V11	6CM7	‡5000Ω	NC	0Ω	0Ω	.1Ω	‡1.8meg	• 2.5meg	• 1.4meg	• 1800Ω
V12	6SN7GTB	500K	†7500Ω	1300Ω	• 110K	†120K	1300Ω	0Ω	.1Ω	
V13	6DQ6	NC	.1Ω	TP	†8500Ω	470K	TP	0Ω	15Ω	TOP CAP ‡28Ω
V14	6AX4GT	TP	NC	¶370K	NC	†0Ω	NC	0Ω	.1Ω	
V15	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡383Ω
V16	5U4GB	NC	¶20K	TP	21Ω	NC	19Ω	TP	¶20K	
V17	21CBP4	0Ω	0Ω	Pin 6 ‡270K	Pin 10 †270K	Pin 11 • 290K	Pin 12 .1Ω			
V201	6BN4	0Ω	1.1meg	0Ω	.1Ω	▪ 470Ω	0Ω	1.1meg		
V202	6CG8A	10K	▪ 5600Ω	0Ω	0Ω	.1Ω	▪ 1000Ω	▪ 10K	0Ω	230K
V203	6AF4A	▪ °820Ω	°22K	.1Ω	.2Ω	°.1Ω	°22K	▪ °820Ω		
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING MAY VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▪ MEASURED FROM 135V SOURCE.
† MEASURED FROM 280V SOURCE.
‡ MEASURED FROM PIN 3 OF V14.
° MEASURED IN "UHF" POSITION.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART

SET 407 FOLDER 3

ZENITH MODELS A1410L, LU, A1411P, PU, A1412G, GU, A1716L, LU, A1717G, GU, A1718G, GU, A1719J, JU, A2001L (Ch. 15A26, Q, U)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 3 push-on type knobs from the front and 4 from the side.
2. Remove 2 metal screws holding the rear cover. Remove the rear cover.
3. Remove the tuner power and output leads and speaker leads.
4. Remove 2 speaker bolts and the speaker.
5. Remove 2 metal screws holding the rear tuner support and remove the tuner.
6. Remove 2 metal screws, located inside the cabinet, holding the volume control bracket.
7. Remove 2 metal screws holding fiber bracket.
8. Remove 4 chassis bolts from the bottom.
9. Remove the chassis.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

MODEL A1411P (CH. 15A26)

TRADE NAME	Zenith	MODELS	CHASSIS
		A1410L, A1411P, A1412G, A1716L, A1717G, A1718G, A1719J	15A26
		A1410LU, A1411PU, A1412GU, A1716LU, A1717GU, A1718GU, A1719JU	15A26U
		A2001L	15A26Q
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Avenue, Chicago 39, Illinois		
TYPE SET	Television Receiver		
TUBES	Fifteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 125 Watts, 1.24 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of the VHF Oscillator, it is necessary to remove the tuner from the cabinet. See "Tuner Alignment Instructions".

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 push-on type knobs from the front. Remove 2 metal screws holding the glass retainer brackets. Tilt glass out at the top and lift up to remove.

SPECIAL ADJUSTMENTS

A. AGC
Observe the picture and advance the AGC control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

B. Focus
No provision is made to vary the focus on this receiver.

C. Fringe Lock
Adjust picture to lock in with hold controls. If picture jitters, tears, etc. adjust Fringe Lock until stable. Readjust the hold controls and check operation on all channels in the area.

D. Width
The width may be varied by means of a metallic sleeve located between the Yoke and Picture Tube neck. Adjust sleeve in or out of the yoke for a picture slightly larger than necessary to fill the screen.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Set Horizontal Hold to the center of its range. Adjust Horizontal Hold Coarse until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see tube placement chart)

FUSE DEVICE

A 6Ω fusible resistor (R89) is used for low voltage power supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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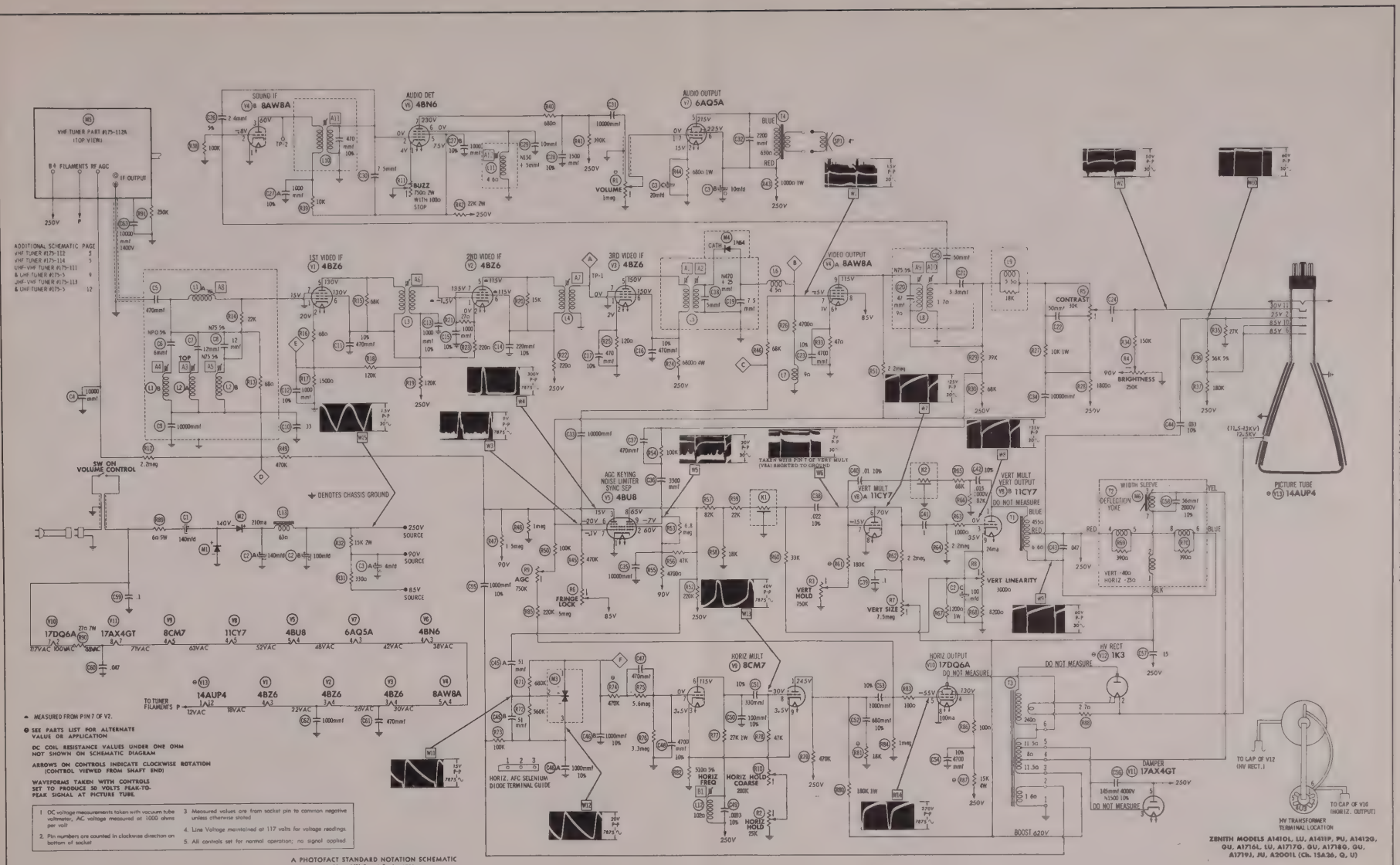
SET 407 FOLDER 3



- ▲ MEASURED FROM PIN 7 OF V2.
- ● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

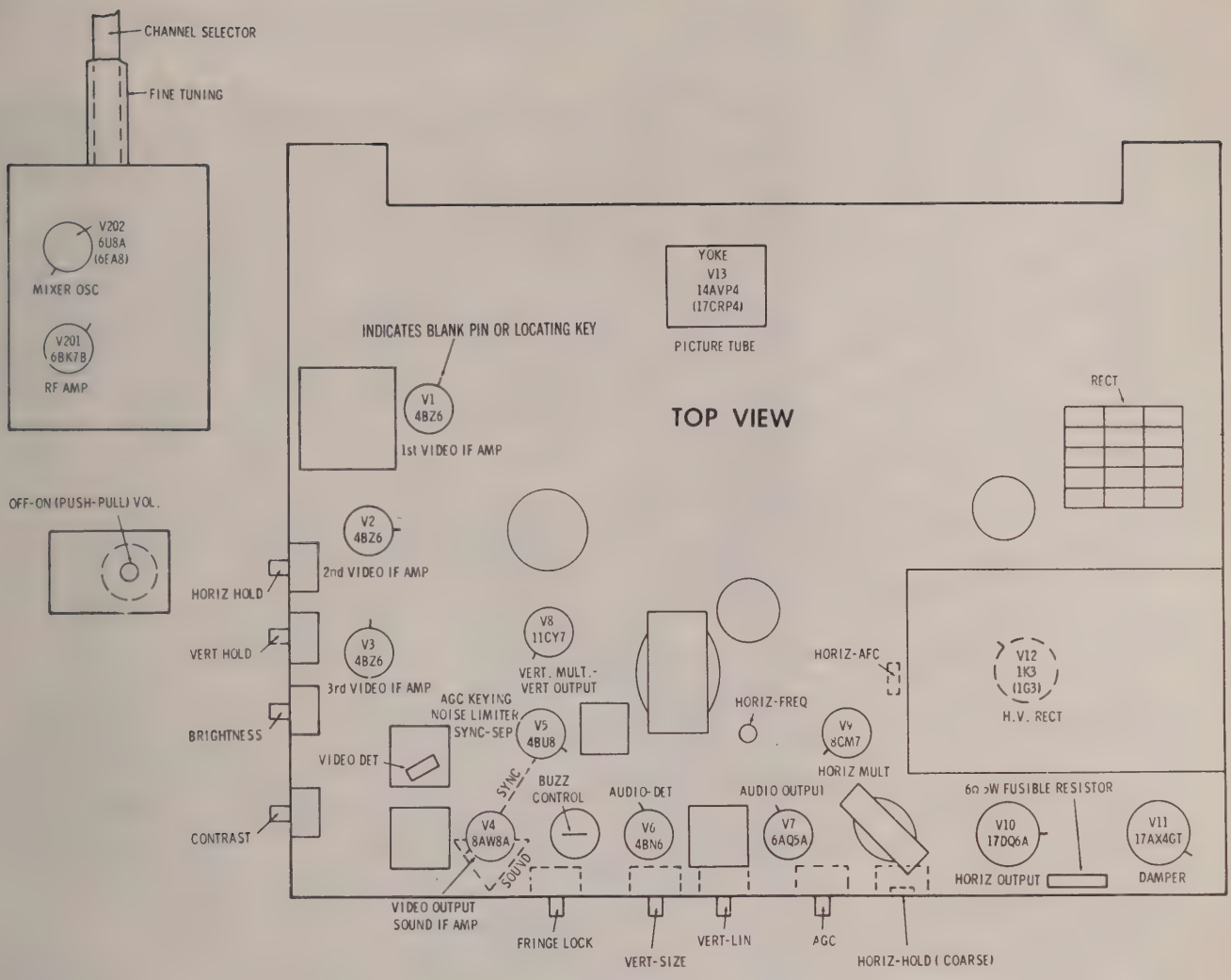
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2. Pin numbers are counted in clockwise direction on bottom of socket
3. Measured values are from socket pin to common negative unless otherwise stated
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

ZENITH MODELS A1410L, LU, A1411P, PU, A1412G, GU, A1716L, LU, A1717G, GU, A1718G, GU, A1719J, JU, A2001L (Ch. 15A26, Q, U)

FOLDER 3

TUBE PLACEMENT CHART



ZENITH MODELS A1410L, LU, A1411P, PU, A1412G, GU, A1716L, LU, A1717G, GU, A1718G, GU, A1719J, JU, A2001L (Ch. 15A26, Q, U)

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

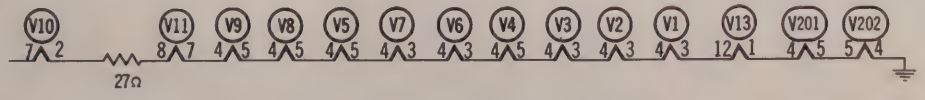
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (R89), Rectifier (M1, M2)

SWEEP FAILURE
No raster, has sound Rectifier (M3), V9, V10, V11, V12, V13
No vertical deflection V8
Poor vert. linearity or foldover V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, M1, M2
Vert. off freq. V8
Horiz. off freq. V9

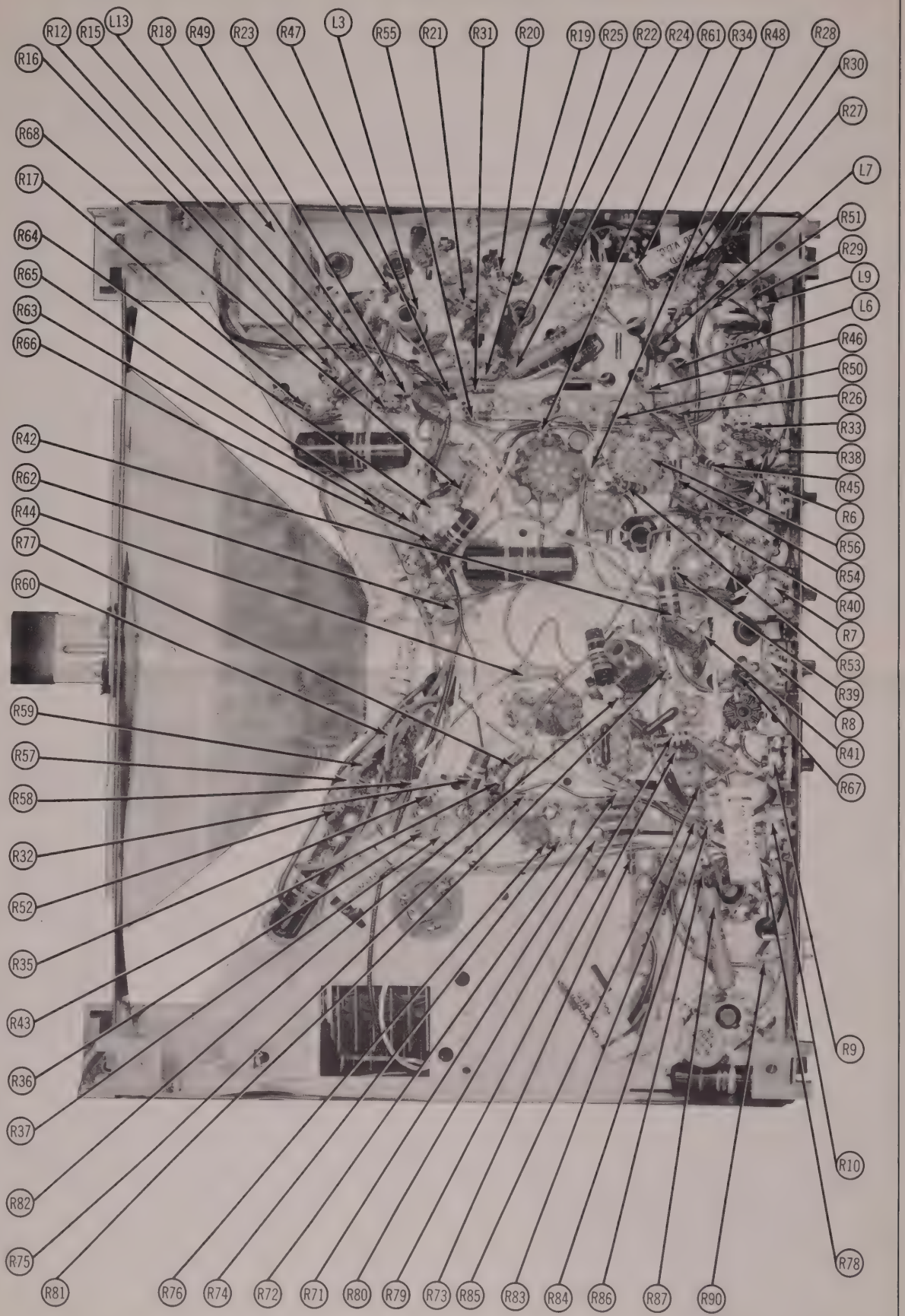
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (M4), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V13
Has pic, no sound V4, V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V5
No horiz. sync V5, M3
No vert. or horiz. sync V5

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



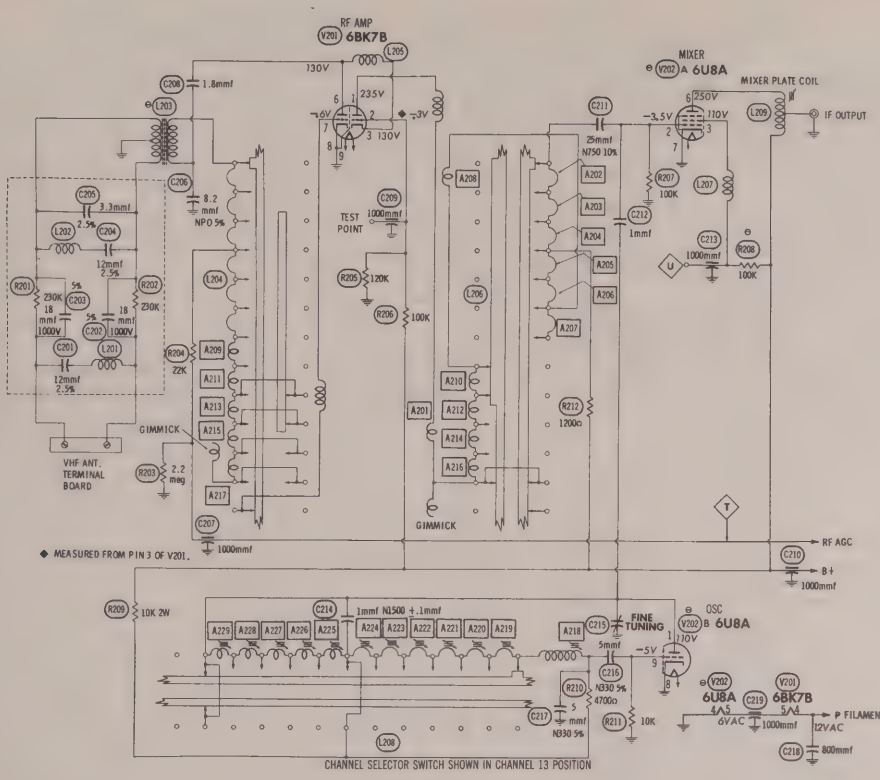
FOLDER 3



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ZENITH MODELS A14101, LU, A14117P, PU, A14123G, QU, A17161, LU, A17172G, QU, A17218G, QU, A17192, JU, A20011L (CH. 13426, Q, U)

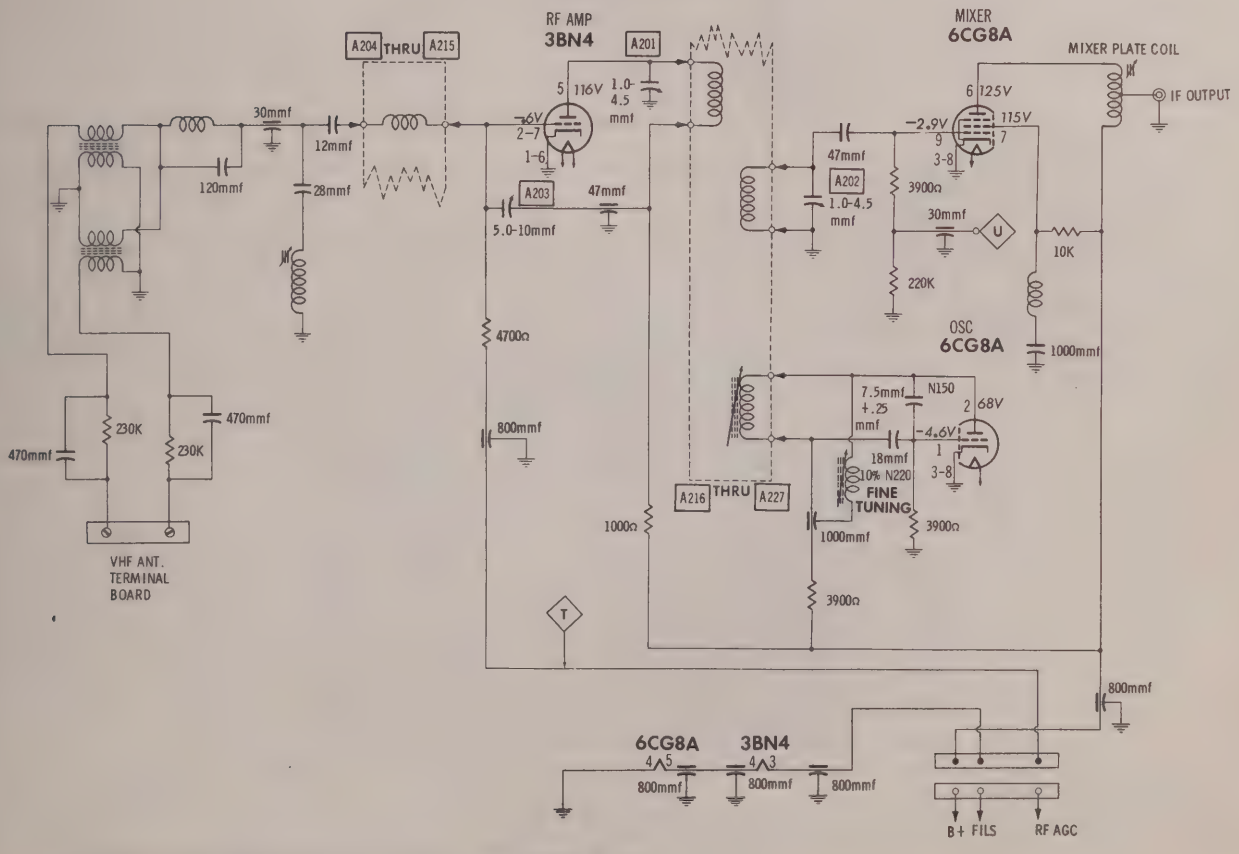
FOLDER 3



VHF TUNER PART #175-112A

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

VHF TUNER #175-112



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

VHF TUNER PART #175-114

VHF TUNER #175-114

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS FOR TUNERS #175-112A & #175-111

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2 volt bias supply to point (T) . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	50-300Ω Matching Trans.	Across VHF antenna terminals thru matching transformer.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point U . Low side to chassis.	A201	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown. Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
2.	"	"	207MC	205.25MC 209.75MC	12	"	A202	"
3.	"	"	201MC	199.25MC 203.75MC	11	"	A203	"
4.	"	"	195MC	193.25MC 197.75MC	10	"	A204	"
5.	"	"	189MC	187.25MC 191.75MC	9	"	A205	"
6.	"	"	183MC	181.25MC 185.75MC	8	"	A206	"
7.	"	"	177MC	175.25MC 179.75MC	7	"	A207	"
8.	"	"	85MC	83.25MC 87.75MC	6	"	A208, A209	"
9.	"	"	79MC	77.25MC 81.75MC	5	"	A210, A211	"
10.	"	"	69MC	67.25MC 71.75MC	4	"	A212, A213	"
11.	"	"	63MC	61.25MC 65.75MC	3	"	A214, A215	"
12.	"	"	57MC	55.25MC 59.75MC	2	"	A216, A217	"

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.
Adjust the Fine Tuning so that the small index hole in the fine tuning cam is centered directly below the channel 13 oscillator adjustment.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	50 to 300Ω Matching Trans.	Across antenna terminals thru matching transformer.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across video detector load. Low side to chassis.	A218	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A219	
			201MC	199.25MC 203.75MC	11		A220	
			195MC	193.25MC 197.75MC	10		A221	
			189MC	187.25MC 191.75MC	9		A222	
			183MC	181.25MC 185.75MC	8		A223	
			177MC	175.25MC 179.75MC	7		A224	
			85MC	83.25MC 87.75MC	6		A225	
			79MC	77.25MC 81.75MC	5		A226	
			69MC	67.25MC 71.75MC	4		A227	
			63MC	61.25MC 65.75MC	3		A228	
			57MC	55.25MC 59.75MC	2		A229	

UHF IF ALIGNMENT TUNER #175-111

Adjust A230 for the most satisfactory picture with a MINIMUM noise on any UHF station.

TUNER ALIGNMENT INSTRUCTIONS (cont)

UHF ALIGNMENT TUNER #175-5

Alignment of the UHF tuner should not be attempted without the proper test equipment.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Fig. 203	High side thru matching network (Fig. 203) to UHF antenna terminals.	713MC (10MC Swp)	711. 25MC	54	Vert. Amp. thru 10K to video detector load. Low side to chassis.	A231, A232, A233	With the UHF tuning knob set to channel 54, the rocker arm on the tuner should be in the horizontal position. If necessary, loosen set screw and turn the shaft independently of the pulley until the arm is in the horizontal position with the channel indication on channel 54. Tighten the set screw. If the calibration is off more than 3 channels, adjust A231 to place video marker at 50% on curve as in Fig. 204. The image (weaker response) will appear also. The response toward counterclockwise position of A231 is the proper response. Adjust A232 and A233 for maximum amplitude of response similar to Fig. 204.
15.	"	"	473MC (10MC Swp)	471. 25MC	14	"		Check for response similar to Fig. 204. If the oscillator is off more than 3 channels, adjust oscillator travel adjustment (osc., mixer and antenna travel adjustments are the three hex nuts on top of the UHF tuner next to the tuner chassis) to scale. Care must be used when making the adjustment so as not to move the rocker arm out of its bearing. Set the mixer and antenna travel adjustments for maximum response on scope.
16.	"	"	887MC (10MC Swp)	885. 25MC	83	"	A234, A235, A236	Adjust A234 to place marker at 50% on curve similar to Fig. 204. Adjust A235 and A236 for maximum amplitude and symmetry.

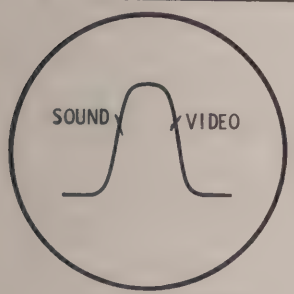


FIG. 201

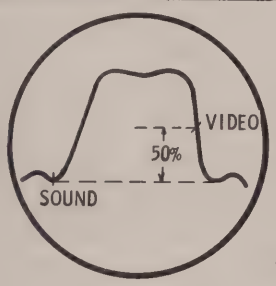


FIG. 202

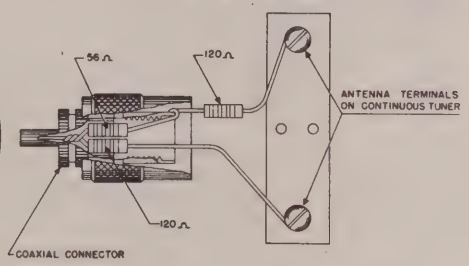


FIG. 203

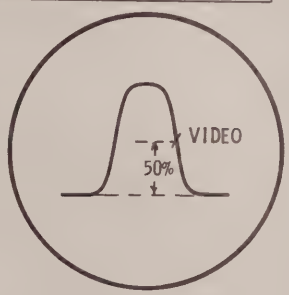
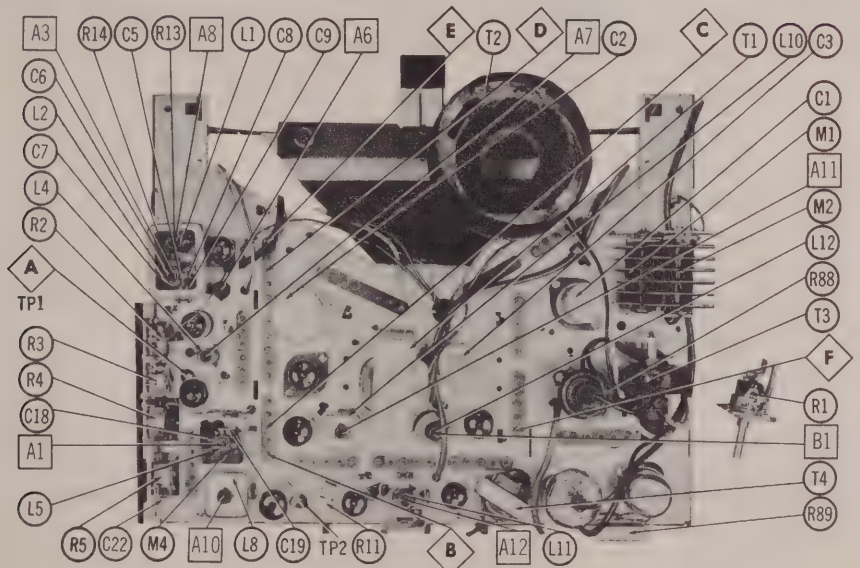


FIG. 204



TP1 3RD VIDEO IF GRID 0V
TP2 SOUND IF PLATE 60V

CHASSIS TOP VIEW

SET 407 FOLDER 3

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS FOR TUNERS #175-114 & #175-113

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a variable bias supply to point (T) . Positive to chassis. Set bias for 2.5 volts.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Matching Trans.	Across antenna terminals thru matching transformer.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K across video detector load.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

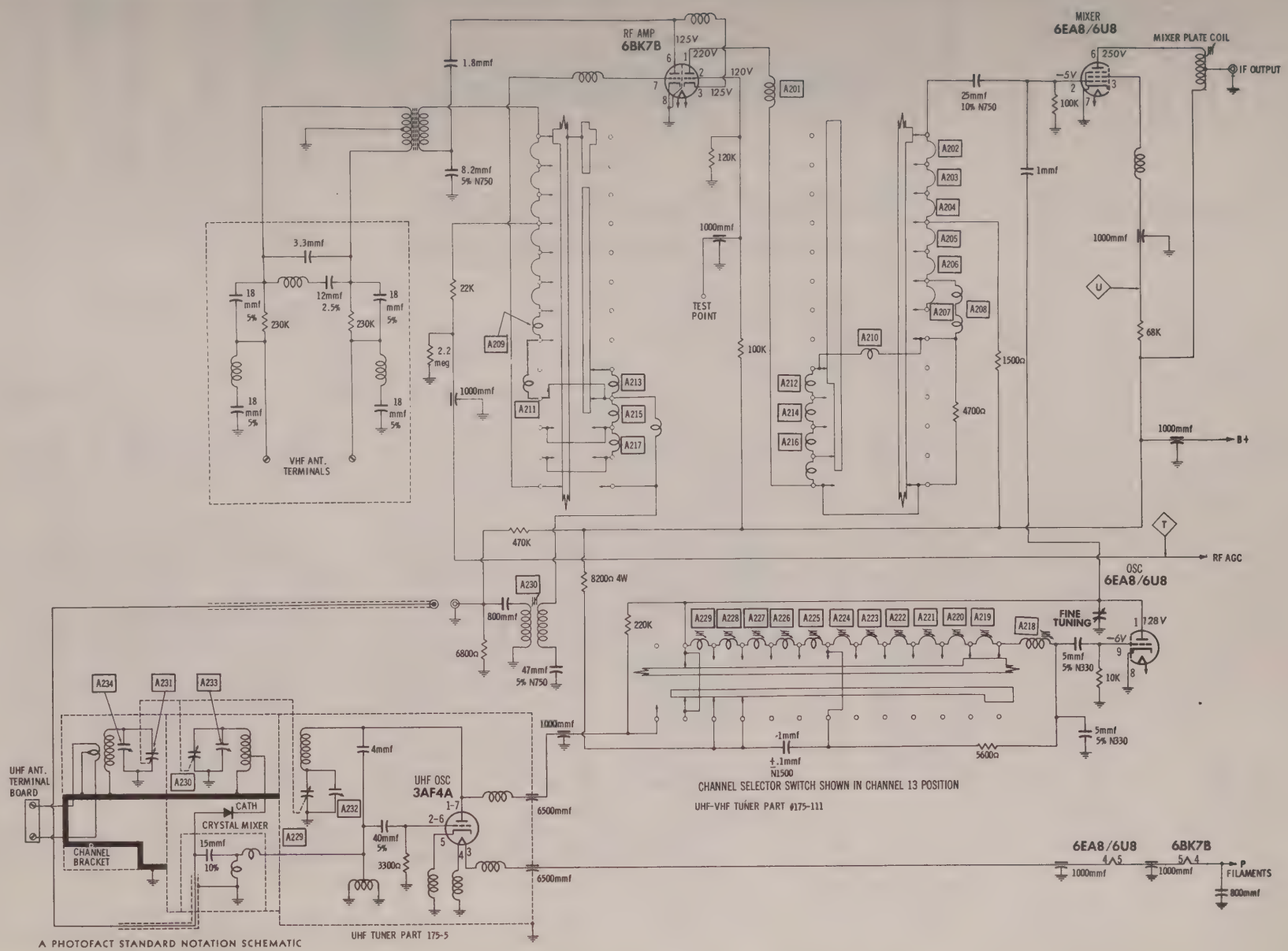
VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across video detector load. Low side to chassis.	A216	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

UHF IF ALIGNMENT FOR TUNER #175-113

Adjust A228 for the most satisfactory picture with MINIMUM noise on any UHF station.



CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

UHF-VHF TUNER PART #175-111

UHF TUNER PART 175-5

A PHOTOFACT STANDARD NOTATION SCHEMATIC

Howard W. Sams & Co., Inc. 1958

UHF TUNER #175-5 & UHF-VHF TUNER #175-111

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st. Video IF Amp	4BZ6	
V2	2nd Video IF Amp.	4BZ6	
V3	3rd Video IF Amp.	4BZ6	
V4	Video Output-Sound IF Amp	8AW8A	
V5	AGC Keying-Noise Limiter-Sync Sep	4BU8	
V6	Audio Det.	4BN6	
V7	Audio Output	6AQ8A	
V8	Vert. Mult. -Vert. Output	1LCV7	
V9	Horiz. Mult.	8CM7	
V10	Horiz. Output	17DQ6A	
V11	Damper	17AX4GT	
V12	HV Rect.	1K3	1G3 *

* Alternate

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	ZENITH PART No	GENERAL ELECTRIC PART No	RCA PART No	SYLVANIA PART No	
V13	14AUP4 17CRP4			14AUP4 ① 17CRP4 ①	① "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP.	VOLT	ZENITH PART No	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SANGAMO PART No.	SPRAGUE PART No.
C1	140	150	22-2745	AFHSI-23	XA026I	FP117	TM8-24	D-086	TVL-1428
C2A	40	300	22-3081	AFH3-99-83	C0734.3	FP236.T		Q-222	R3676 *
B	100	300						MT-4580	
C	100	50							
C3A	4	350	22-2744	AFH3-180	C1445	FP345.2		T-610	TVL-3806.6
B	10	400							
C	20	25							

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	SPRAGUE PART No.	
C4	10000		22-3	BPD-01	DD-103	BYA10S1	DC511	5HK-81	
C5	470		22-6	BPD-00047	DD-471	BYA10T47 C10V6C	UC-5447	5GA-T47	NPO 5%
C6	6		22-2381						N75 5%
C7	12		22-2379						N75 5%
C8	12		22-2379						N75 5%
C9	10000		22-3	BPD-01	DD-103	BYA10S1	DC511	5HK-81	
C10	.33	200	22-2159	P288N-33		PM4P33	GEM-2033		
C11	470		22-16		MD-471				10%
C12	1000		22-17						10%
C13	1000		22-17						10%
C14	220		22-2626	1469-00022	MD-220	5RST23		MS-322	10%
C15	1000		22-17						10%
C16	470		22-3022	1469-00047	MD-471	5R5T47		MS-347	10%
C17	470		22-16		MD-471				10%
C18	5		22-2990						N470 ± .25mmf
C19	7.5		22-2742						
C20	47		22-2457						N75 5%
C21	3.3		22-2343	NPO-SI 3.3	TCZ-3R3	CTA5V33C	ZT-5S33	5TCCB-V33	
C22	50		22-2480	SI 50	D6-500	LT6Q5	UC-545	5GA-Q5	
C23	4700		22-14						10%
C24	.1	200	22-1777	P288N-1	DF-104	CUB2P1	GEM-301	2TM-P1	
C25	50		22-2480	SI 50	D6-500	LT6Q5	UC-545	5GA-Q5	
C26	3.4		22-2596						5%
C27A	1000		22-21						10%
B	1000								10%
C28	1500		22-13						10%
C29	10		22-2731						N150 ± .5mmf
C30	7.5		22-2742						
C31	10000		22-3	BPD-01	DD-103	BYA10S1	DC511	5HK-81	
C32	2200		22-8	BPD-0022	DD-222	BYA10D22	UC-5222	5HK-D22	
C33	10000		22-3	BPD-01	DD-103	BYA10S1	DC511	5HK-81	
C34	10000		22-3	BPD-01	DD-103	BYA10S1	DC511	5HK-81	
C35	10000		22-3	BPD-01	DD-103	BYA10S1	DC511	5HK-81	
C36	3300		22-11	BPD-0033	DD-332	BYA10D33	UC-5233	5HK-D33	
C37	470		22-6	BPD-00047	DD-471	BYA10T47	UC-5347	5HK-T47	
C38	.022	400	22-2621	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	10%
C39	.1	600	22-1841	P668N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C40	.01	200	22-2585	P288N-01	D6-103	CUB4S1	GEM-411	4TM-S1	10%
C41	.1	400	22-2061	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C42	.015	1000	22-3040	P108N-015		CUB1S15	GEM-10115	1OTM-S15	10%
C43	.047	300	22-1778	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C44	.033	400	22-2635	P488N-033		PM4S33	GEM-4133	6TM-S33	10%
C45A	SI		22-25	BPD-00005	DD-500	LIQQ5I	UC-545	5GA-Q5	
B	SI			BPD-00005	DD-500	LIQQ5I	UC-545	5GA-Q5	
C46A	1000		22-21						10%
B	1000								10%
C47	470		22-6	BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C48	4700		22-14						10%
C49	.0033	200	22-2664				GEM-16233		10%
C50	100		22-9	NPO-DI 100	DD-101	LI0T1	ZT-531	5TCC-T1	10%
C51	330		22-2868	1469-00033	MD-331	5R5T33		MS-333	10%
C52	680		22-2666	1469-00068	MD-681	1R5T68		MS-368	10%
C53	1000		22-2183	1469-001		1R5D1		MS-31	10%
C54	4700		22-14						10%
C55	1000		22-17						10%
C56	145	4000	22-2869						N1500 10%
C57	.15	400	22-2281	P488N-15		CUB4P15	GEM-4015	4TM-P15	
C58	56	2000							10%
C59	.1	400	22-2061	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C60	.047	600	22-1844	P668N-01	DF-503	CUB6S47	GEM-6147	6TM-S47	
C61	470		22-6	BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C62	1000		22-7	BPD-001	DD-102	BYA5D1	DC511	5HK-D1	
C63	10000	1400	22-2655	DAC-27		BYA10S1	DC511	5HK-81	

PARTS LIST AND DESCRIPTIONS

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST. ance	WATTS	ZENITH PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No	
R1A	1meg	½	63-4048				FP16L	Volume - Note 1
B	Switch						Not Req.	
R2A	25K	½	63-3696	B-38	A47-25K-S	Q1-130	TA2S3L	Horiz. Hold
B	Shaft			Not Req.	KSE-3	Not Req.	Not Req.	
R3A	750K	½	63-3263	B-66	A47-750K-S	Q1-136	U54	Vert. Hold
B	Shaft			Not Req.	KSE-3	Not Req.	Not Req.	
R4A	250K	½	63-4049	B-50	A47-250K-S	Q1-130	TA354L	Brightness
B	Shaft			Not Req.	KSE-3	Not Req.	Not Req.	
R5	30K	½	63-4060					Contrast
R6A	5meg	½	63-4060	AB-67	A47-5meg-S	Q1-141	PTA56L	Fringe Lock
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R7A	7.5meg	½	63-4061	AB-69	A47-7.5meg-S	Q1-143	PTA75S	Vert. Size
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R8A	3000Ω	½	63-4051	AB-8	A43-3000-S	Q1-112	PTA352L	Vert. Lin.
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R9A	750K	½	63-3263	AB-66	A47-750K-S	Q1-136	PTA754L	AGC
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R10A	200K	½	63-3697	BX-46	A47-200K-S	Q1-129		Horiz. Hold Coarse
B	Shaft			Not Req.	RN-3	TQ		
R11	750Ω	2(WW)	63-3284		39-800-50			Buzz with 100Ω stop

Note 1. Alternate Part #63-4062.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ZENITH PART No.	NOTES
	OHMS	WATT		
R12	2.2meg		63-1926	
R13	68Ω		63-1727	
R14	22K		63-2948	
R15	68K		63-3992	
R16	68Ω		63-1726	
R17	1500Ω		63-1752	
R18	130K		63-1873	
R19	130K		63-1873	
R20	15K		63-2372	
R21	27Ω		63-1719	
R22	220Ω		63-1756	
R23	220Ω		63-1758	
R24	6800Ω	4	63-3976	
R25	120Ω		63-1747	
R26	4700Ω		63-1813	
R27	10K	1	63-1071	
R28	1800Ω		63-1796	
R29	39K		63-1852	
R30	68K		63-1862	
R31	330Ω		63-1765	
R32	15K	2	63-942	
R33	47Ω		63-1729	
R34	150K		63-1878	
R35	27K		63-1845	
R36	56K 5%		63-1856	
R37	180K		63-1890	
R38	100K		63-1870	
R39	10K		63-1827	
R40	8800Ω		63-1779	
R41	390K		63-1894	
R42	22K	2	63-1966	
R43	1000Ω	1	63-965	
R44	680Ω	1	63-2290	
R45	470K		63-1898	
R46	68K		63-1862	
R47	1.5meg		63-1918	
R48	1meg		63-1912	
R49	470K		63-1898	
R50	100K		63-1869	
R51	2.2meg		63-1925	

ITEM No.	RATING		ZENITH PART No.	NOTES
	OHMS	WATT		
R52	220K		63-1883	
R53	5.6meg		63-1946	
R54	100K		63-1870	
R55	4700Ω		63-1814	
R56	47K		63-1855	
R57	82K		63-1866	
R58	18K		63-1838	
R59	22K		63-1841	
R60	33K		63-4008	
R61	180K		63-1880	Note 1
R62	2.2meg		63-1925	
R63	1000Ω		63-1786	
R64	2.2meg		63-1925	
R65	68K		63-1862	
R66	82K		63-1866	
R67	1200Ω	1	63-3590	
R68	8200Ω		63-1824	
R69	390Ω			
R70	390Ω			
R71	680K		63-1904	
R72	560K		63-1901	
R73	100K		63-1869	
R74	470K		63-1898	Note 2
R75	5.6meg		63-1943	
R76	3.3meg		63-1932	
R77	27K	1	63-1192	
R78	47K		63-1855	
R79	470K		63-1898	
R80	180K	1	63-2313	
R81	18K		63-3195	Note 3
R82	510Ω 5%		63-1775	
R83	100Ω		63-1744	
R84	1meg		63-1912	
R85	220K		63-1883	
R86	100Ω		63-1744	
R87	15K	4		Note 4
R88	2.7Ω		63-3631	
R89	8Ω	5	63-3644	
R90	27Ω	7	63-3972	
R91	230K			

Note 1. Some versions may use 220K in this application (Part #63-1883).
Note 2. Some versions may use 1.5meg in this application (Part #63-1918).
Note 3. Some versions may use 15K in this application (Part #63-1834).
Note 4. Some versions may use 10K 4W in this application (Part #63-3623).

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ZENITH PART No.	Halldorson PART No	Merit PART No	Rom PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Vert. Output	95-1593	Z1900①②	A-2823 ①	V307②③	VO-100 ③	26S73 ③	A-116X ③
T2A	Yoke-Horiz. (12.8MH)	95-1579 ④	DF-606⑤	MDF-91 ⑤	Y90F19/47 ⑤	DY-13A ⑤	Y-39 ⑤	Y-40 & NW11
B	(90°)-Vert. (38MH)							
M7	Rear Cover & Centering Device	S-23237						
T3	Horiz. Output	S-42878						

① Use 8 to 1 turns ratio.
② Connect as autoformer.
③ Drill new mounting hole(s).
④ Includes M7.
⑤ Use original yoke damping network if necessary. Use original rear cover and centering device, cut and form a piece of .010 gauge fish paper inside the yoke itself and support with an acetate cement, to provide an insulation between the width sleeve and the yoke proper.
⑥ Cut and tape orange lead. Connect yoke terminal #2 to terminal #4 of T3, yoke terminal #7 to terminal #3 of T3. Connect horizontal damping capacitor across yoke terminals #2 & #4.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Rom PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	9700Ω	3-4Ω	95-1534	Z1117 ①	A-2932①		A-3879 ①	24S83	S-11X	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	49-814	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		ZENITH PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Rom PART No	NOTES
L1A	1st. Video IF	S-41887					Includes Caps.
B	41.25MC Trap						
L2A	39.75MC Trap	S-41883					
B	47.25MC Trap						
L3	2nd. Video IF	S-42874	17-4623 *	TV-130 *	6224 *	VF-3 *	
L4	3rd. Video IF	S-41891	17-4623 *	TV-130 *	6224 *	VF-3 *	
L5	4th. Video IF	S-42734					
L6	Resonant Choke	S-23444					25 Microhenries
L7	Shunt Peaking Coil	S-16015		19-3300	TV-190	6133	VF-7	33S Microhenries
L8A	4.5MC Trap	S-42872					
B	1st. Sound IF						
L9	Series Peaking Coil	S-20680		19-3135 ▲		6153 ▲		137 Microhenries, wound on 10K resistor include Cap.
L10	2nd. Sound IF	S-42875					
L11	Quadrature Coil	S-19020		20-1005 *◆	TV-121 ◆	1480 * ◆	

* Drill new mounting hole. ▲ Parallel with 15K resistor. ◆ Remove C29 (10mmf) from this circuit.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ZENITH PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Rom PART No.	Thordarson PART No	Triad PART No.	
L12	102Ω		S-22352				S-102			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 100Ω (%)	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Rom PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
L13	.210A @250VDC	63Ω	.4 Hy.	95-1581						C-27X

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ZENITH PART No.	REPLACEMENT DATA
K1	Vert. Integrator		87-5	
K2	Vert. Feedback		87-4	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	ZENITH PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.210A	212-14 ①	1090A ①	1N1007 ③	RS300BL ①	300 ①	1) Selenium type.
					3FS1 ②	M500 ②	2) Silicon type.
M2	.210A	212-14 ①	1090A ①	1N1007 ③	RS300BL ①	300 ①	3) Germanium type.
					3FS1 ②	M500 ②	4) Two required.
M3		103-20 ①	1215 ①④		ITI ① ④		

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ZENITH PART No.	CBS PART No.	SYLVANIA PART No	
M4	1N84	103-23	1N84	1N84	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M5	Tuner	176-112	VHF, Ch. 15A26
	Tuner	176-114	VHF, Ch. 15A26, Q
	Tuner	176-111	UHF-VHF, Ch. 15A28U
	Tuner	176-113	UHF-VHF, Ch. 15A28U
	Tuner	176-5	UHF, Ch. 15A28U
M6	Sleeve		Width
M7	Centering Device	S-23237	Includes yoke rear cover

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

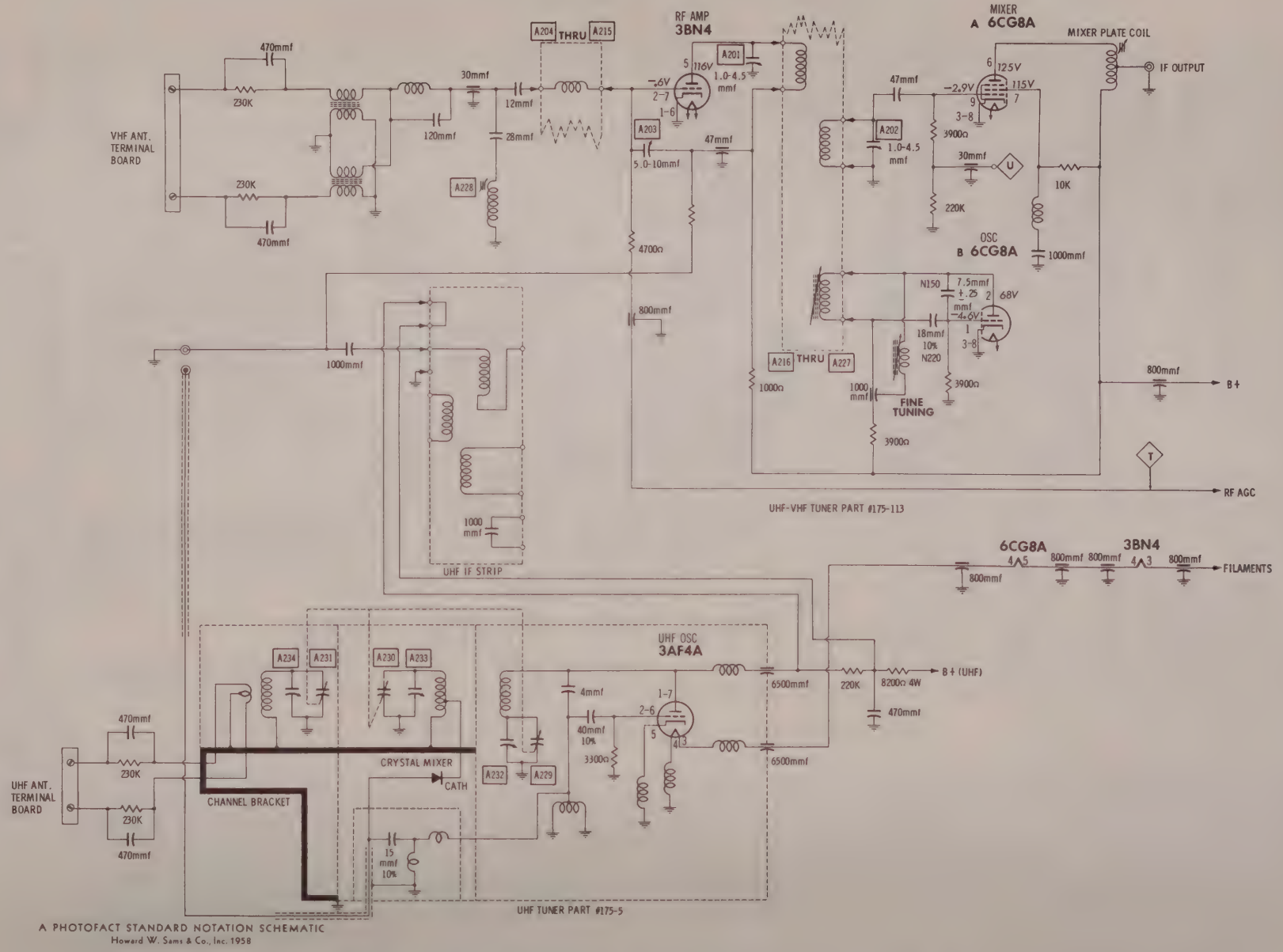
NAME	PART NO.	DESCRIPTION
Safety Glass	192-246	Models A1410L, LU
Safety Glass	192-247	Models A1411P, PU, A1413G, GU
Safety Glass	192-248	Models A1761L, LU
Safety Glass	192-249	Models A1717G, GU, A1718G, GU, A1719J, JU, A2001L
Knob	46-1897	On-Off-Volume, Models A1401L, LU
Knob	46-1898	On-Off-Volume, Models A1411P, PU, A1413G, GU
Knob	46-1922	On-Off-Volume, Models A1761L, LU
Knob	46-1923	On-Off-Volume, Models A1717G, GU, A1718G, GU
Knob	46-1924	On-Off-Volume, Models A1719J, JU, A2001L
Knob	46-1913	Horiz., Vert. Hold, Brightness, Contrast, Models A1401L, LU, A1411P, PU, A1413G, GU
Knob	46-1914	Horiz., Vert. Hold, Brightness, Contrast, Models A1761L, LU, A1717G, GU, A1718G, GU, A1719J, JU, A2001L
Knob	46-1898	Channel Selector, Models A1401L, LU
Knob	46-1900	Channel Selector, Models A1411P, PU, A1413G, GU
Knob	46-1919	Channel Selector, Models A1761L, LU
Knob	46-1920	Channel Selector, Models A1717G, GU, A1718G, GU
Knob	S-40969	Channel Selector, Models A1719J, JU, A2001L
Knob	S-43092	UHF Dial, Models A1401L, LU, A1411P, PU, A1413G, GU
Knob	S-40981	UHF Dial, Models A1761L, LU, A1717G, GU, A1718G, GU, A1719J, JU
Knob	S-40431	Fine Tuning, Models A1401L, LU, A1411P, PU, A1413G, GU
Knob	S-40898	Fine Tuning, Models A1761L, LU, A1717G, GU, A1718G, GU, A1719J, JU, A2001L

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8685 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8484 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

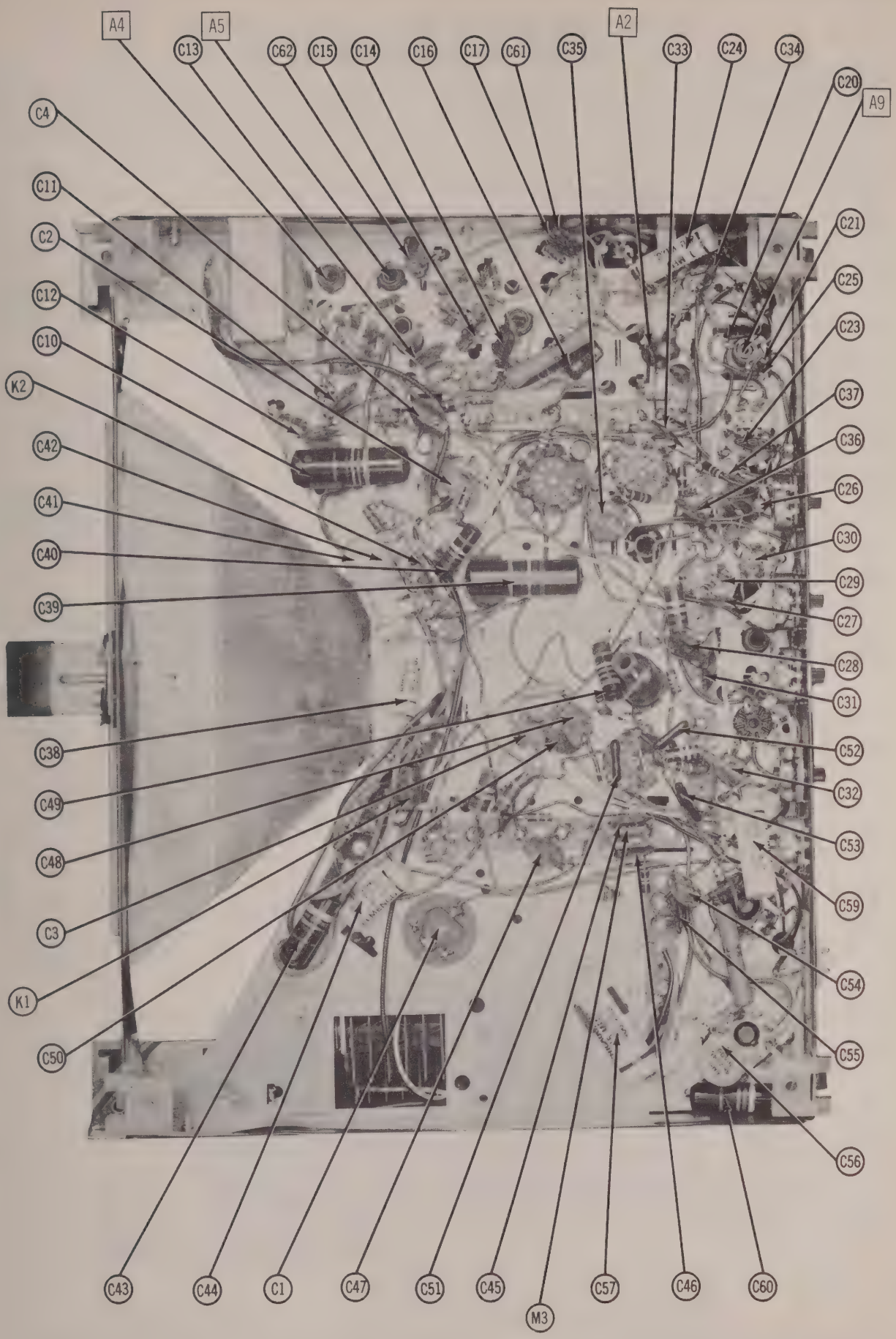
ZENITH MODELS A1410L, LU, A1411P, PU, A1413G, GU, A1761L, LU, A1717G, GU, A1718G, GU, A1719J, JU, A2001L (Ch. 15A26, Q, U)

FOLDER 3



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

UHF TUNER #175-5 & UHF-VHF TUNER #175-113



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizonial input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470mmf	High side to point Ⓐ. Low side to chassis.	44MC (10MC Swp)	39.75MC 41.25MC 45.75MC	Between any two channels	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis. (Across video det. load)	A1, A2	Set sweep generator output to produce 3 volts peak to peak on scope. Adjust A1 and A2 alternately for maximum gain and symmetry with the 45.75MC marker positioned as shown in Fig. 1. The 39.75MC marker can fall within ±.5MC of the specified frequency. If the desired response cannot be obtained check to see that the cores are entering their respective windings from opposite ends of coils.
2.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	"	39.75MC 41.25MC 47.75MC	"	"	A3, A4, A5, A6	Connect a clip lead from point Ⓒ to chassis. Connect a clip lead from point Ⓓ to point Ⓔ. Use high scope gain and adjust A3 thru A6 for MINIMUM marker amplitudes as in Fig. 2. A3 controls the 39.75MC marker, A4 controls the 41.25MC marker and A5 controls the 47.25MC marker.
3.	"	"	"	41.25MC 42.75MC 45.0MC 45.75MC	"	"	A6, A7, A8 and Mixer Plate Coil	Disconnect the clip lead from point Ⓔ and connect to chassis. Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. A6 affects the low frequency side of the curve and A7 affects the high frequency side.

SOUND IF ALIGNMENT

Connect an adjustable attenuator between the antenna and receiver terminals. Tune in a modulated TV signal and adjust the attenuator until the signal is below the limiting level of the 4BN6 (V6) as evidenced by a hiss similar to super regeneration in the sound. Adjust A9, A10, A11 and A12 for maximum sound and best quality. Adjust the buzz control (R11) for MINIMUM buzz. If the hiss disappears during alignment, further reduce the signal until the hiss returns.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGES 6, 7 & 8.

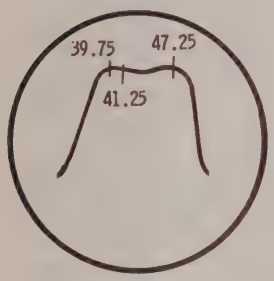


FIG. 1

FIG. 2

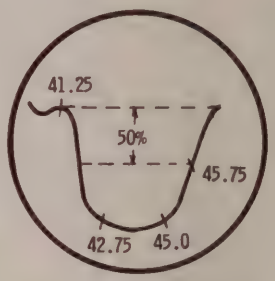


FIG. 3

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BK7B	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6U8A	6EA8 *

* Alternate.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	12		22-2679						2.5%
C202	18	1000	22-2680						5%
C203	18	1000	22-2680						5%
C204	12		22-2679						2.5%
C205	3.3		22-2343						2.5%
C206	8.2		22-2681						NPO 5%
C207	1000		22-2889	EF-001	MFT-1000			503C-D1	
C208	1.8		22-2428						
C209	1000		22-2889	EF-001	MFT-1000			503C-D1	
C210	1000		22-2889	EF-001	MFT-1000			503C-D1	
C211	25		22-2671	N750-D1 25	DTN-25	C10Q25U	TC7-25	5TCU-Q25	N750 10%
C212	1		22-2720	NPO-S1 1	TCZ-1		TCO-1	5TCCB-V1	
C213	1000		22-2889	EF-001	MFT-1000			503C-D1	
C214	1		22-2714						N1500 ±.1mmf
C215									
C216	5		22-2716						N330 5%
C217	5		22-2716						N330 5%
C218	800		22-2331						
C219	1000		22-2889	EF-001	MFT-1000			503C-D1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ZENITH PART No.	NOTES
	OHMS	WATT		
R201	230K			
R202	230K			
R203	2.2meg			
R204	22K			
R205	120K			
R206	100K			

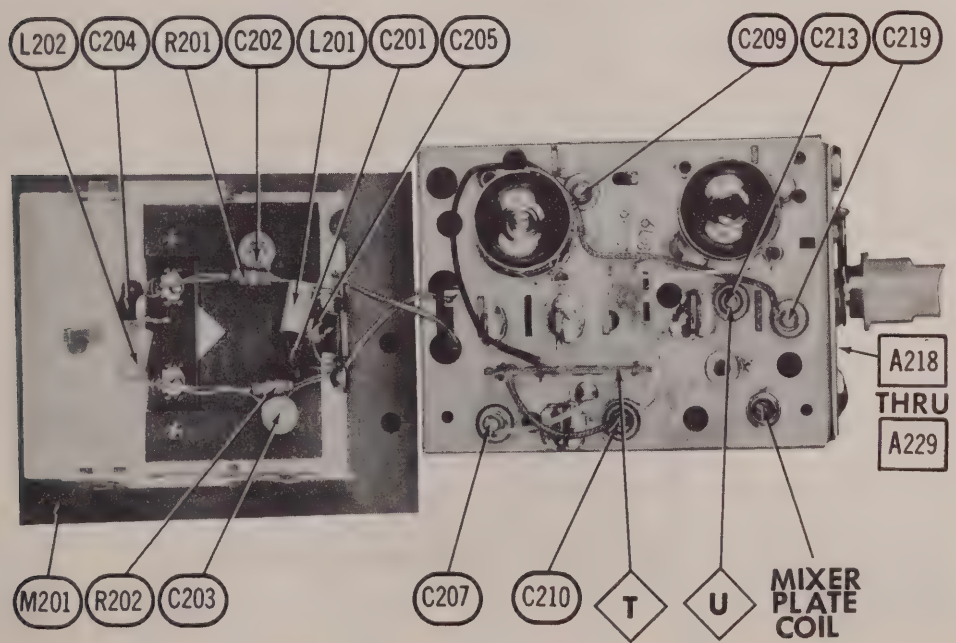
ITEM No.	RATING		ZENITH PART No.	NOTES
	OHMS	WATT		
R207	100K			
R208	100K			Note 1
R209	10K	2	63-3176	
R210	4700Ω			
R211	10K			
R212	1200Ω			

Note 1. Some versions may use 68K in this application.

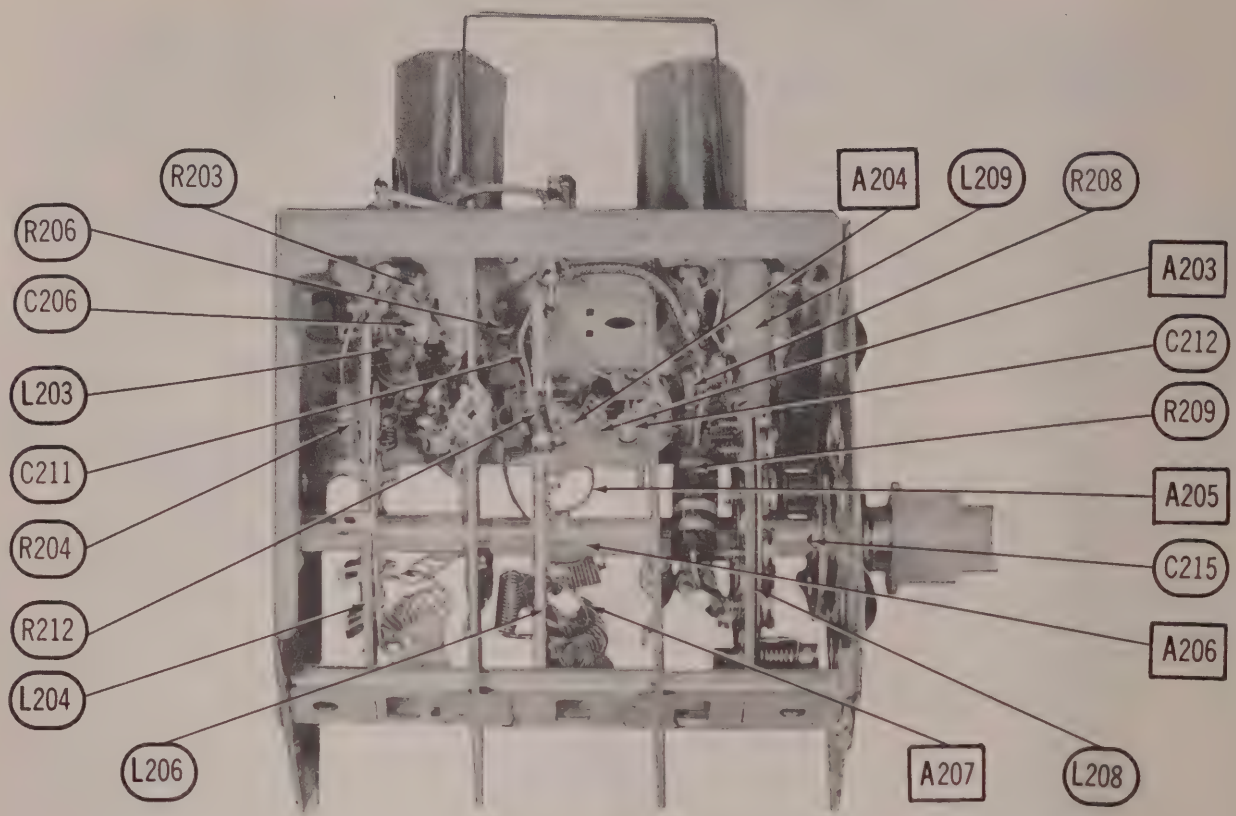
COILS (RF-IF)

ITEM No.	USE	ZENITH PART No.	NOTES
L201	IF Trap Coil	20-567	
L202	IF Trap Coil	20-567	
L203	Ant. Trans.	S-24644	
	Ant. Trans.	S-24645	Alternate
L204	Ant. Coils	S-23641	Channel 2-13, Complete wafer Assy.
L205	Neut. Coil	20-633	

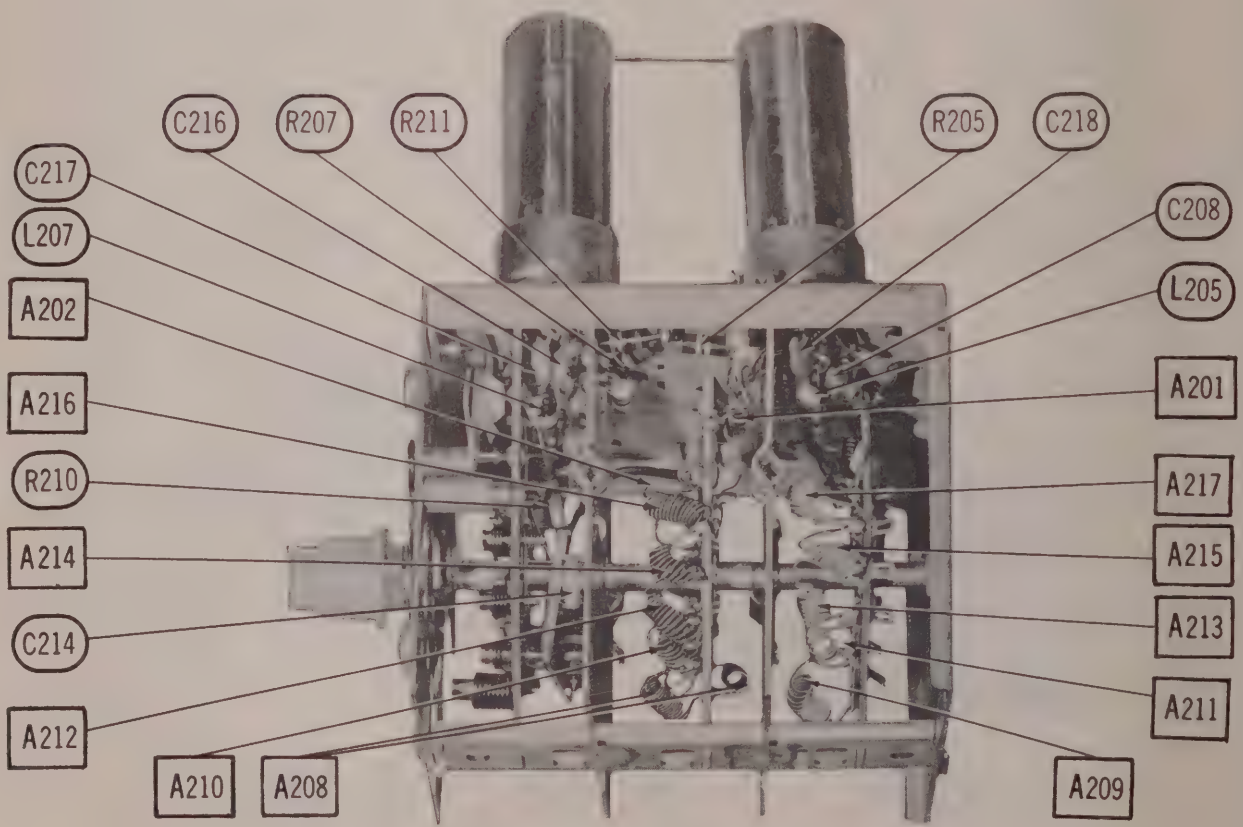
ITEM No.	USE	ZENITH PART No.	NOTES
L206	RF Coils	S-23640	Channel 2-13, Complete wafer Assy.
L207	RF Choke	20-632	
L208	Osc. Coils	S-41807	Channel 2-13, Complete wafer Assy.
L209	Mixer Plate Coil	S-42840	



TUNER—TOP VIEW



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BZ6	800K	1500Ω	5.5Ω	4.5Ω	††247Ω	††247Ω	0Ω		
V2	4BZ6	60K	††27Ω	5.5Ω	6.5Ω	†220Ω	†220Ω	INF		
V3	4BZ6	.1Ω	120Ω	6.5Ω	7.5Ω	†6800Ω	†6800Ω	0Ω		
V4	8AW8A	0Ω	100K	†32K	9Ω	7.5Ω	47Ω	4700Ω	†15K	†7500Ω
V5	4BU8	0Ω	†15K	500K	11Ω	12Ω	†800K	• †730K	†30K	†6.8meg
V6	4BN6	•520Ω	.5Ω	9Ω	10Ω	†22K	4.6Ω	†390K		
V7	6AQ5A	0Ω	680Ω	10Ω	11Ω	†1600Ω	†1000Ω	0Ω		
V8	11CY7	†455Ω	NC	2.2meg	14Ω	12Ω	•‡5meg	350K	0Ω	•1400Ω
V9	8CM7	†160K	NC	510Ω	16Ω	14Ω	†27K	2.2meg	•150K	510Ω
V10	17DQ6A	NC	47Ω	TP	†15K	1meg	TP	50Ω	0Ω	TOP CAP ‡11.5Ω
V11	17AX4GT	NC	NC	¶570K	NC	†0Ω	NC	16Ω	20Ω	
V12	1K3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡250Ω
V13	14AUP4	3Ω	27K	Pin 6 †60K	Pin 10 †60K	Pin 11 •180K	Pin 12 4.5Ω			
V201	6BK7B	†1200Ω	55K	INF	3Ω	1.5Ω	INF	1.2meg	0Ω	0Ω
V202	6U8A	†10K	100K	†100K	0Ω	1.5Ω	†6.5Ω	0Ω	0Ω	10K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT. .

• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

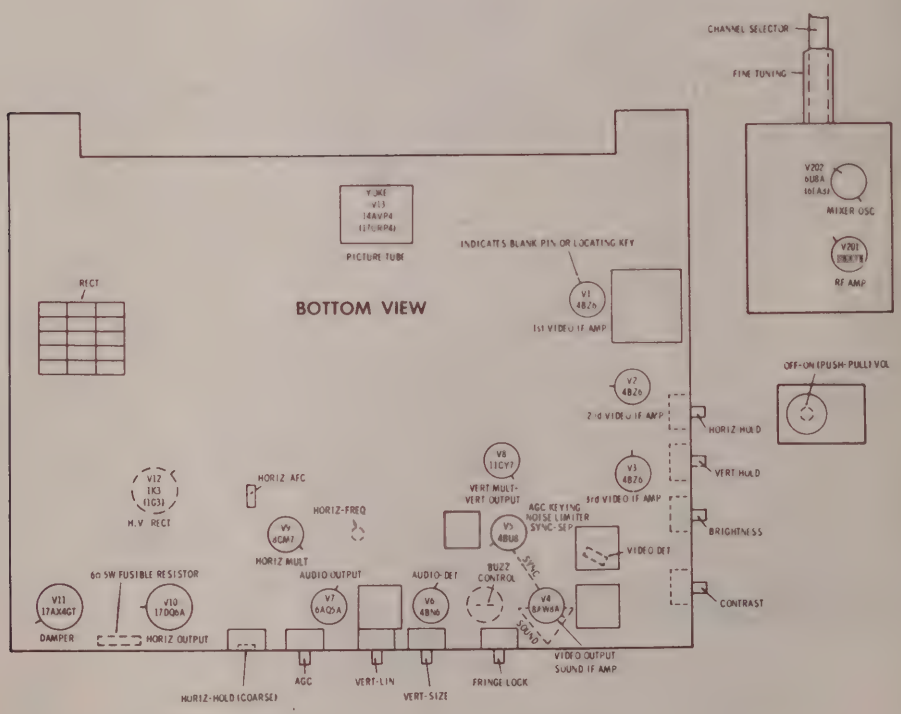
† MEASURED FROM 250V SOURCE.

‡ MEASURED FROM PIN 3 OF V11.

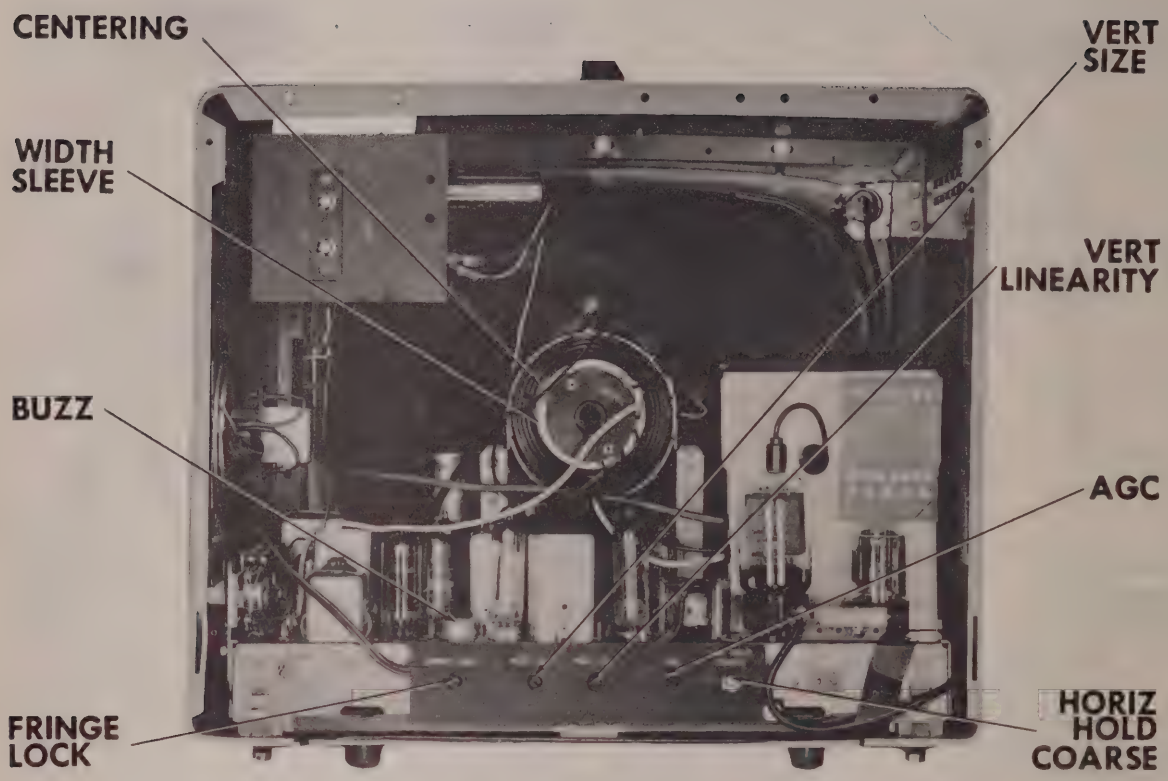
†† MEASURED FROM PIN 7 OF V2.

NC NO CONNECTION.

TP TIE POINT.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a clip lead from point Ⓕ to chassis. Connect another short clip lead across the Horizontal Frequency Coil (L12). Set the Horizontal Hold to the center of its range.

Tune in a TV signal and adjust the Horizontal Hold Coarse until the picture is as nearly in sync as possible.

Remove the clip lead from L12 and adjust the Horizontal Frequency Slug (B1) until the picture is as nearly synchronized as possible.

Remove the clip lead from point Ⓕ to chassis. If necessary to insure positive synchronization, retouch the Horizontal Hold Coarse.

The PHOTOFACT Servicer

SET 407 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JULY 15, 1958

CONTENTS PHOTOFACT SET 407

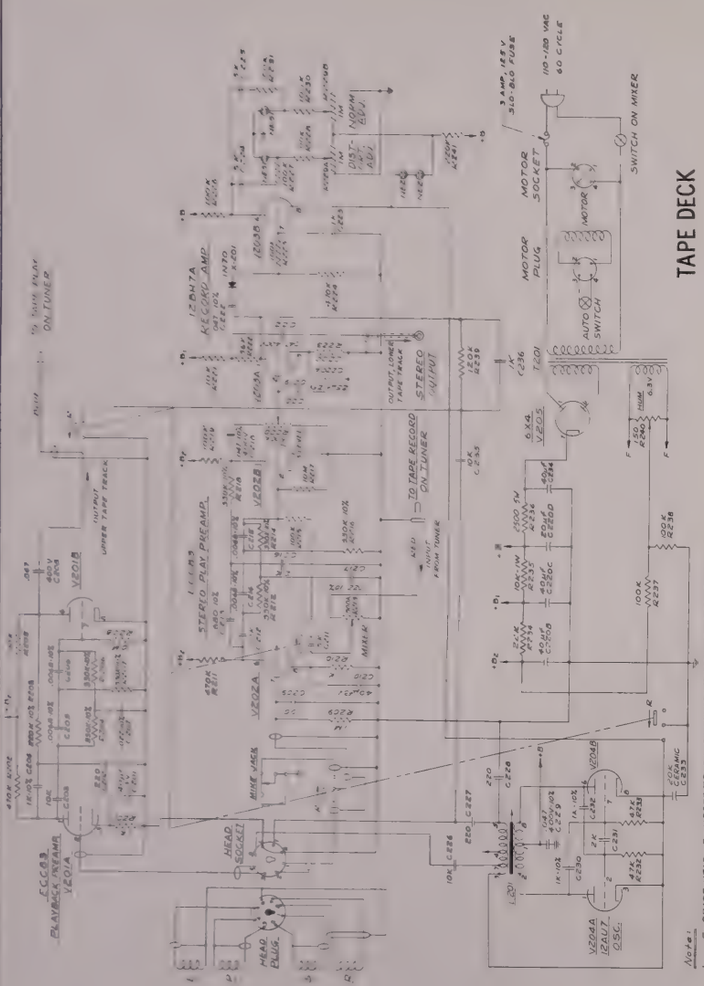
TRADE NAME AND MODEL	SET AND FOLDER NO.
TELEVISION RECEIVERS	
CORONADO	
TV2-9465A, TV2-9466A, TV2-9470A, TV2-9471A, TV2-9475A, TV2-9476A, TV2-9480A, TV2-9481A	407-1
SPARTAN	
Chassis U25-01AA thru U25-11AA, V25-01AA thru V25-11AA (25 Series)	407-2
ZENITH	
A1410L, LU, A1411P, PU, A1412G, GU, A1716L, LU, A1717G, GU, A1718G, GU, A1719J, JU, A2001L (Ch. 15A26, Q, U)	407-3
PRODUCTION CHANGE BULLETIN	
PHILCO Television Rec.	
E2002C, E2004F, G, SP, E2006SA, F2003I, SS, F2005, UE2002C, UE2004F, G, SP, UE2006SA, UF2003I, SS, UF2005 (Ch. 7E10, U, 7E11, U, 7E12, U, 8E11, U, 8E13)	407-4
PHILCO	
F-1372, F-1372X, F-1374, F-1402	407-4
F-1404	407-4
SPARTAN	
Chassis CR-729AA, CR-729BA	407-4

TRADE NAME AND MODEL	SET AND FOLDER NO.
OTHER EQUIPMENT	
COLUMBIA RECORDS	
534, 705	407-5
EMERSON	
867B (Ch. 120366B)	407-6
FIRESTONE	
4-A-166 (Code 1-7-5T10), 4-A-168 (Code 1-7-5C8)	407-7
FISHER	
FM-90X	407-8
GENERAL ELECTRIC	
C420A, C421	407-9
GRUNDIG MAJESTIC Tape Recorder	
TK5, TK8, TK8/3D, TK8E, TM8, TM8E, TM8U	407-10
GRUNDIG MAJESTIC	
8058, 8068, 8095, 8098	407-11
KNIGHT	
KN-515 (92SX400)	407-12
MOPAR	
851	407-13
MOTOROLA	
5T24GW-1 5T24WN-1, 5T25B-1, 5T25M-1, 5T25MC-1 (Ch. HS-628, HS-629)	407-14

The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.

PACKARD-BELL MODELS 16RP1, 21RP1

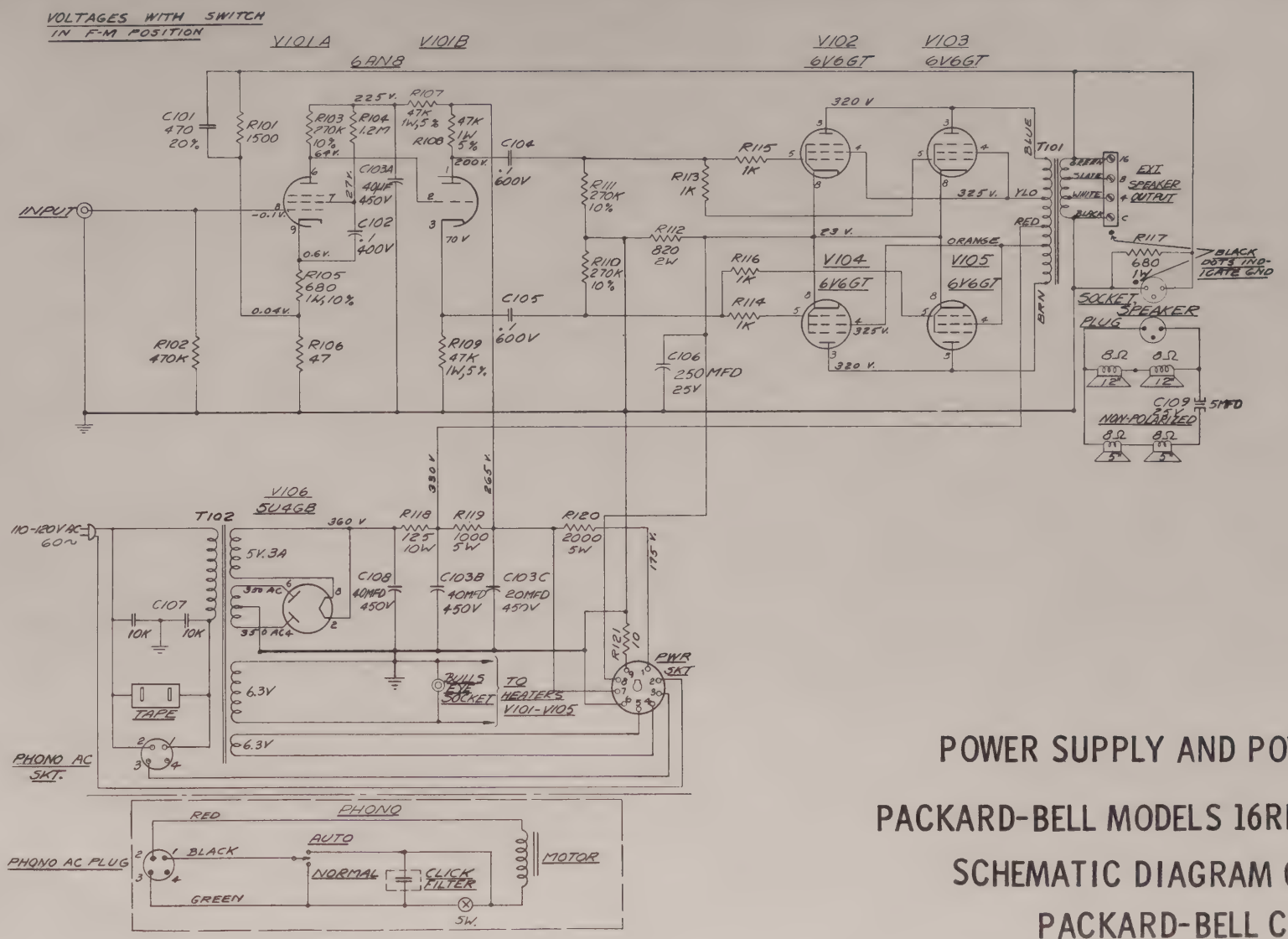
TAPE DECK



PACKARD-BELL MODELS 16RP1, 21RP1

FM AM TUNER

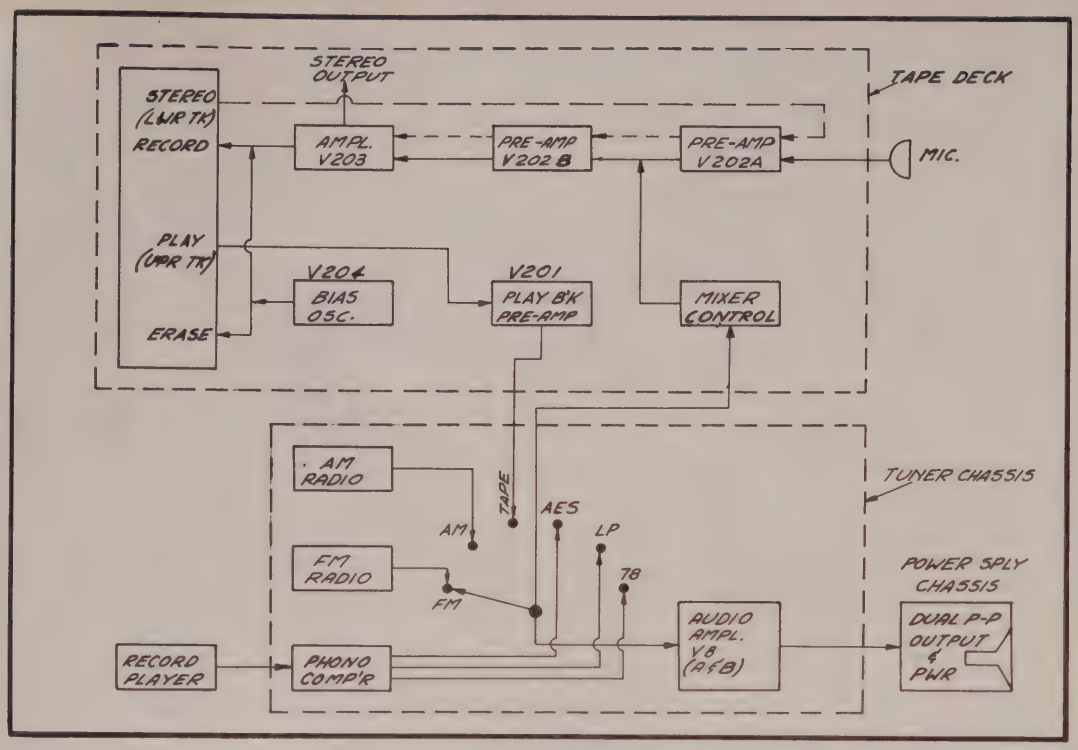
SCHEMATIC DIAGRAM COURTESY PACKARD-BELL CO.



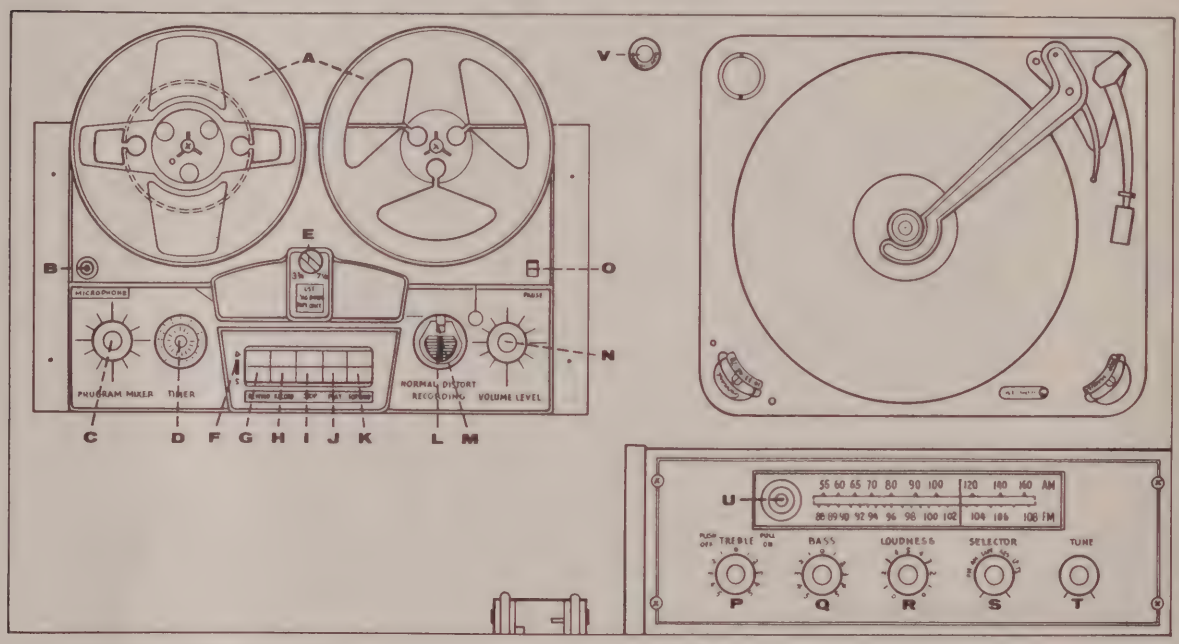
POWER SUPPLY AND POWER AMP

PACKARD-BELL MODELS 16RP1, 21RP1

SCHEMATIC DIAGRAM COURTESY PACKARD-BELL CO.



21RP1 Block Diagram



TAPE RECORDER DECK

- **A** Tape Reels
- **B** Microphone Input Receptacle
- **C** Program Mixer
- **D** Tape Index Timer
- **E** Speed Control Button
- **F** Safety Lever
- **G** Rewind Button
- **H** Record Button
- **I** Stop Button
- **J** Play Button
- **K** Forward Button
- **L** Record Level Indicators (Normal and Distort Lamps)
- **M** Automatic Shutoff Switch
- **N** Volume Level
- **O** Pause Button

TUNER

- **P** On-Off and Treble
- **Q** Bass
- **R** Loudness
- **S** Selector (AM-FM Radio, Tape or Phono)
- **T** Tuning (Station Selection)
- **U** Tuning "Indicator,"

V MAGIC POWER MINDER
(Turn to MAN'L before turning set on)

PACKARD-BELL MODELS 16RP1, 21RP1

For service information on record changer see Garrard RC-121 PHOTOFACT folder 355-4 or record changer manual RC-10

PHOTOFACT* Folder

EIA ELECTRONIC INDUSTRIES ASSOCIATION MEMBER

PRODUCTION CHANGE BULLETIN 213

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 15 IN SET 376

PHILCO MODEL F-1404

Philco Models E-1356, E-1357, E-1358 were covered in Photofact Folder 15 — Set 376.

Model F-1404 is electrically identical to the models covered except for the following changes.

COMPONENT CHANGES

R3 is decreased from 1meg to 470K.

R2, Tone Control, is increased from 500K to 1meg (Part #33-5587-27).

R1, Volume Control, is changed to Part #33-5587-26.

SP1 (4" Speaker) is changed to Part #45-9757; two used in Model F-1404.

NEW RECORD CHANGER

Model F-1404 uses Philco Record Changer Model M-40. For service information on the 4 speed automatic record changer see Photofact Set 396 — Folder 13.

PRODUCTION CHANGE BULLETIN 213

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 13 IN SET 384

PHILCO MODELS F-1372, F-1372X, F-1374, F-1402

Philco Model E-1355 was covered in Photofact Folder 13 — Set 384.

Model F-1372, F-1372X, F-1374 and F-1402 are electrically identical to the model covered except for the following changes.

COMPONENT CHANGES

C2 is omitted and is replaced with a 33K $\frac{1}{2}$ watt resistor.

R2, Tone Control, for Model F-1402 is changed to Part #33-5587-24.

Model F-1374 uses two speakers. The part number for the speaker mounted in the base is 36-1654-17 and the part number for the speaker mounted in the lid is 36-1654-18.

The part number for SP1 in Model F-1402 is changed to 36-1654-5.

NEW RECORD CHANGER

Model F-1402 uses Philco Record Changer Model M-40A. For service information on the 4 speed automatic record changer see Photofact Set 396 — Folder 13.

Models F-1372, F-1372X and F-1374 use a manual record changer.

PRODUCTION CHANGE BULLETIN 213

*****CORRECTION NOTICE*****

SPARTAN CHASSIS CR-729AA, CR-729BA

Spartan Chassis CR-729AA and CR-729BA were covered in Photofact Folder 15 - Set 395.

The RCA part number replacement data for transistors is in error. All RCA replacements are to be deleted.

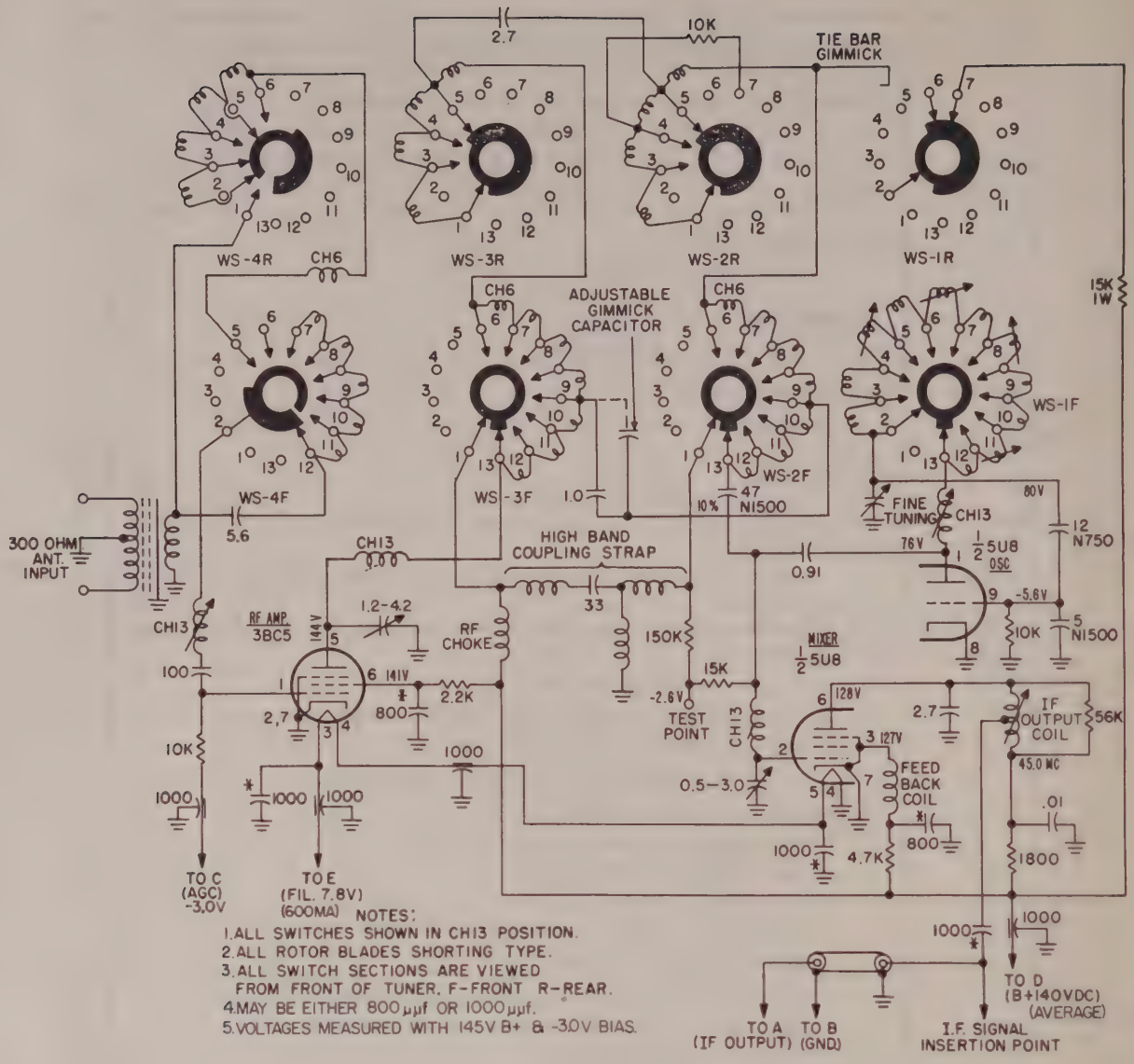
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 10 IN SET 348

	Philco Models E2002C, E2004F, E2004G, E2004SP, UE2002C, UE2004F, UE2004G, UF2004SP (Ch. 7E10, U, 7E11, U) were covered in Photofact Folder 10 — Set 348. Models E2006SA, F2003I, F2003SS, F2005, UE2006SA, UF2003I, UF2003SS, UF2005 (Ch. 7E12, U, 8E11, U, 8E13) are added, along with late production changes, with the publication of this bulletin.
Ch. 7E10, 7E11 (Run 4)	TO IMPROVE HORIZONTAL SWEEP R54 is decreased from 15K to 10K.
Run 5	TO INCREASE WIDTH R59 is decreased from 1500Ω to 1200Ω.
Ch. 7E10U, 7E11U (Run 2)	TO IMPROVE HORIZONTAL SWEEP R54 is decreased from 15K to 10K. TO INCREASE WIDTH R59 is decreased from 1500Ω to 1200Ω.
Ch. 7E12	VHF TUNER CHANGED Models using Ch. 7E12 use VHF Tuner #T-71, A schematic showing the new tuner is given on the reverse side.
Ch. 8E11, U, 8E13	COMPONENT CHANGES C32 is decreased from 680mmf to 560mmf. A 330Ω ½ watt resistor and a 33mmf capacitor (wired in series) are added from the junction of R24 and C34 to ground. A 2.7meg resistor is added from pin 7 of V6A to the junction of R39 and R40. R27 is decreased from 560K to 150K. R28 is decreased from 1.8meg to 470K. R30 is decreased from 6800Ω to 3900Ω. R32 is omitted. A 100Ω resistor is added from pin 1 of V9 to ground. R41 is increased from 470K to 1.5meg. R51, C40, C39, R50 are contained in a Component Combination Unit, Part #30-6024. R2B is increased from 1meg to 2.5 meg with an 850K stop, Part #33-5592-1. R55 is increased from 130K to 160K 5%. C59 is omitted. R65 is increased from 21Ω 10 watt to 31Ω 15 watt. R63 is increased from 2200Ω to 3300Ω. V13, Damper, is changed from 12AX4GTA to 19AU4. Pin numbers remain the same. V12, Horizontal Output, is changed from 25DN6 to 12DQ6A. With the change, pin 5 is the control grid, pin 4 is the screen grid, pin 8 is cathode and suppressor grid, pins 2 and 7 are filaments. A 100Ω resistor is added from pin 4 of V12 (12DQ6A) to 135V source. R54 is decreased from 15K to 10K. R3B is changed to 2.5meg with an 850K stop, Part #33-5592-2. R3A, B, Vertical Hold-Height, is changed to Part #32-8658-3. T3, Deflection Yoke, is changed to Part #76-11070-2. T1, Horizontal Output Transformer, is changed to Part #32-8746-2.

(Continued on Reverse Side)



T-71 VHF Tuner

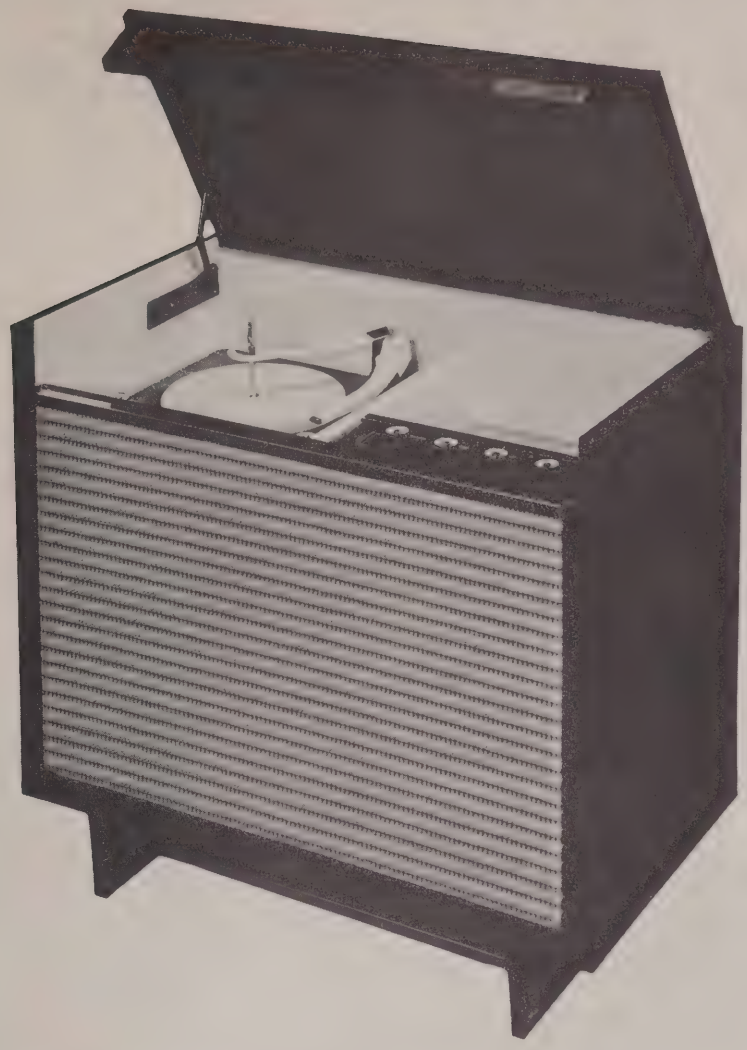
SCHEMATIC COURTESY PHILCO CORPORATION

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

COLUMBIA RECORDS MODELS 534, 705

COLUMBIA RECORDS
MODELS 534, 705



COLUMBIA RECORDS
MODELS 534, 705

TRADE NAME	Columbia Records Models 534, 705
MANUFACTURER	Columbia Records, 799 Seventh Ave., New York 19, N. Y.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Five)	Types 12AU7 Preamp.-Phase Inv., 12AX7 AF Amplifier, (2) 6L6GB Output, 5U4GB Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING 1 Amp. @ 117 Volts AC (101 Watts Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE V-M MODEL 1200A-PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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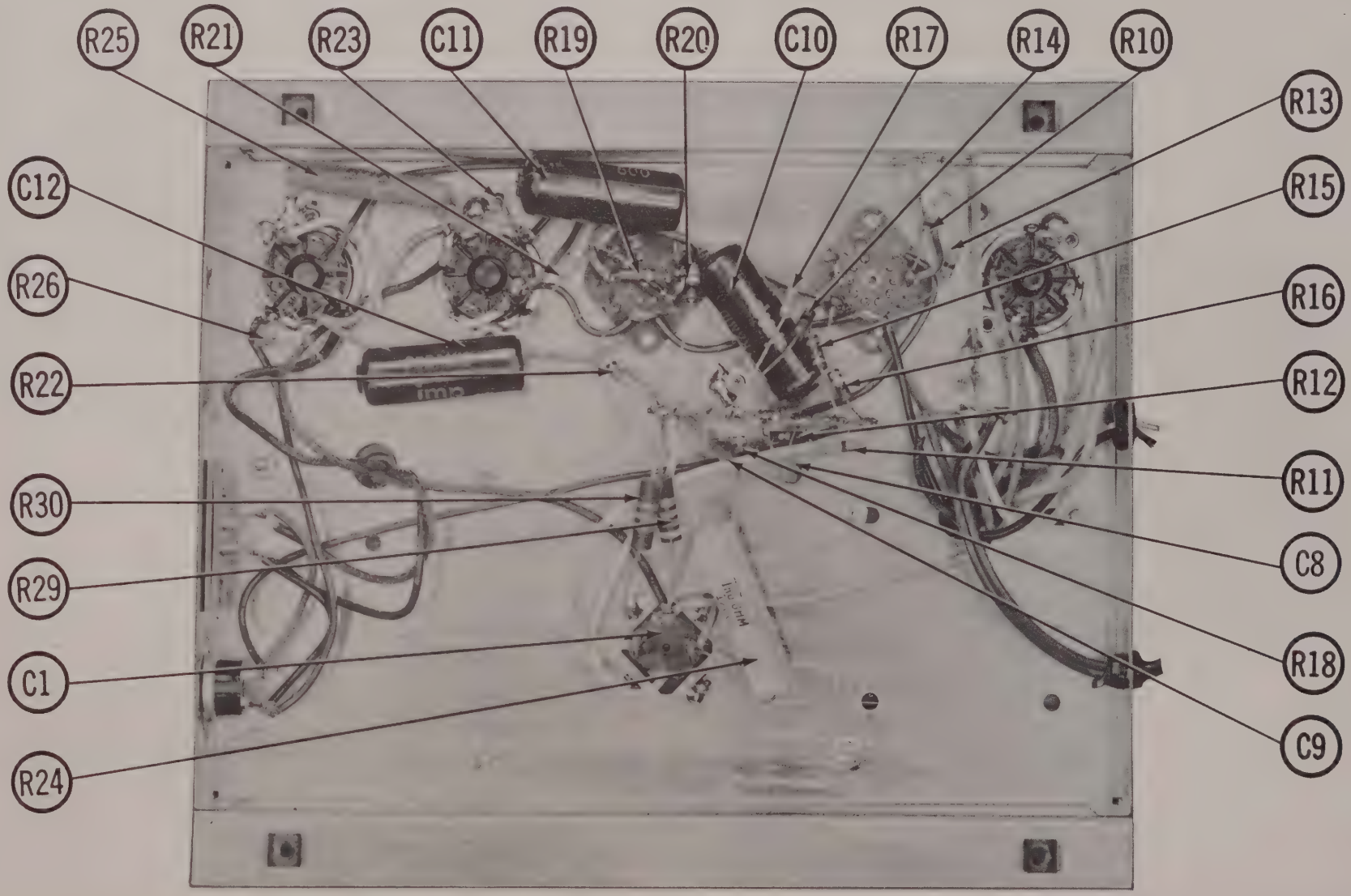


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamp. - Phase Inv.	12AU7	
V2	Driver	12AX7	
V3	Output	6L6GB	
V4	Output	6L6GB	
V5	Rectifier	5U4GB	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Columbia Records PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450	11B725	AFH4-18-30	D0174	FP447	TMQ-123	Q-061	TVL-4773
B	20	450							
C	▲20	450							
D	■20	450							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Columbia Records PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C3	470			BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C4	330			BPD-00033	DD-331	L10T33	UC-5333	5GA-T33	
C5	470			BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C6	4000			BPD-004	DD-402	BYA10D4	UC-5240	5HK-D4	
C7	4000			BPD-004	DD-402	BYA10D4	UC-5240	5HK-D4	
C8	180			BPD-00018	DD-181	L10T18		5GA-T18	
C9	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C10	.1	600		P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C11	.1	600		P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C12	.1	600		P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C13	1.5	200	11B726						

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Columbia Records PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3meg	½	9B573					Loudness, Tap @ 1meg &
B	Switch							Power On-Off 2meg
R2A	3meg	½	9B575	B-84	A47-3meg-S	Q11-140	U59	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	250K	½	9B574	B-51	A47-250K-Z	Q13-130	U44	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4A	500Ω	½	9B572	AB-4	A47-500-S	B11-103	U2	D. E. P.
B	Shaft			AK-1	FKS-1/4	SK3	Not Req.	

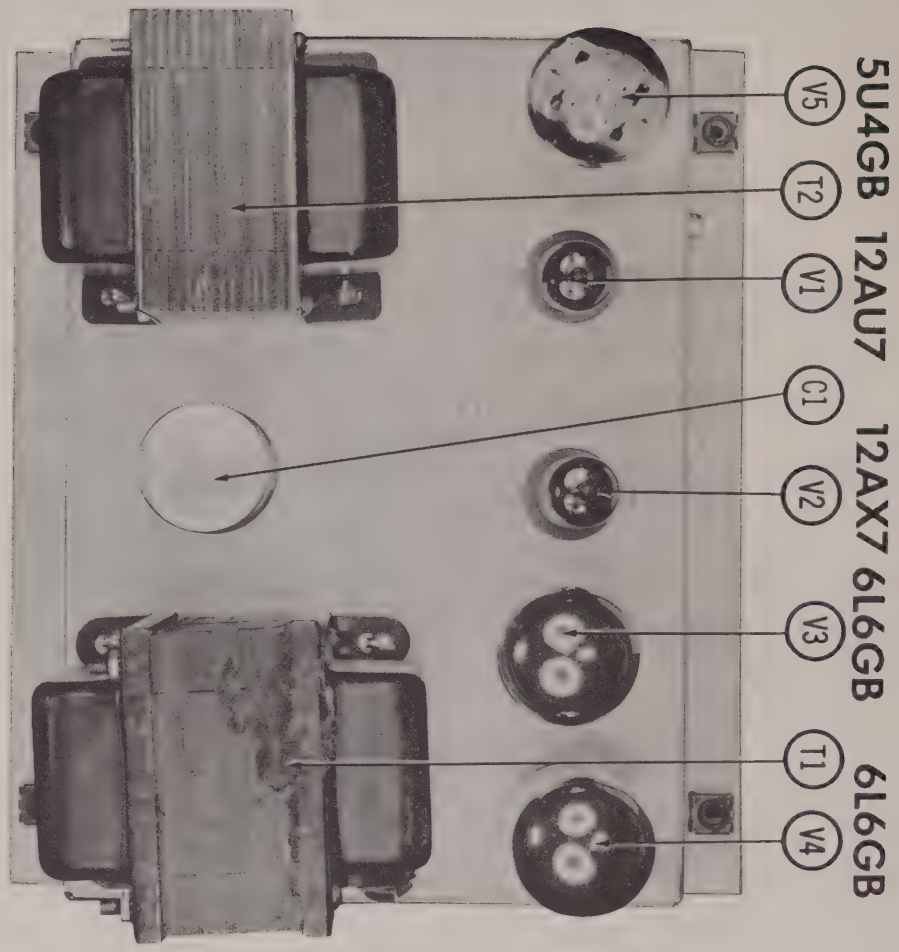
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Columbia Records PART No.	NOTES
R5	270K 5%			
R6	1meg			
R7	100K			
R8	100K			
R9	100K			
R10	10meg			
R11	100K			
R12	1meg 5%			
R13	1000Ω			
R14	100Ω 5%			
R15	820Ω 5%			
R16	100K			
R17	470Ω			

ITEM No.	RATING OHMS	RATING WATT	Columbia Records PART No.	NOTES
R18	470K			
R19	2.2meg			
R20	100K			
R21	47K			
R22	100K			
R23	470K			
R24	12K	10(WW)	16B415	
R25	270Ω	5(WW)	16B414	
R26	470K			
R27	220Ω			
R28	47Ω	1		
R29	47K	1		
R30	27K	1		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Columbia Records PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1A	740VCT @ .120A	5V @ 2.5A	TR-126 ①				PC8410		
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 2.9A									

① Alternate Part #2B108

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Columbia Records PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7500Ω CT	6-8Ω	TR-125 ①	Z1405 ②	A-3128 ②		A-3801 ②	24S57 ②	S-60A ②	① Alternate Part #3B222 ② Drill new mounting holes.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Columbia Records PART No.	QUAM PART No.	
SP1	10"	PM	6-8Ω	1B126 ①		① Used in Model 534. ② Used in Model 705.
SP2	3½"	PM	3-4Ω	1B125 ①	3A07	
SP3	3½"	PM	3-4Ω	1B125 ①	3A07	
SP4	3½"	PM	3-4Ω	1B125 ①	3A07	
	12"	PM	6-8Ω	1B128 ②		
	3½"	PM	3-4Ω	1B127 ②	3A07	
	3½"	PM	3-4Ω	1B127 ②	3A07	
	3½"	PM	3-4Ω	1B127 ②	3A07	

COILS

ITEM No.	USE	REPLACEMENT DATA					
		Columbia Records PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Crossover Choke	21B103					

PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	Columbia Records PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1	TO-400-OV	118-TS	N8-1 & N8-3			

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Columbia Records PART No.	JENSEN PART No.	WALCO PART No.	
M2	(78RPM)	† CRA-55 or ♦ CRA-55D	† W-64S or ♦ W-64D	† Jewel ♦ Diamond
	(LP)	† CRA-55LP or ♦ CRA-55LPD	† W-64MGS or ♦ W-64MGD	

MISCELLANEOUS

ITEM No.	PART NAME	Columbia Records PART No.	NOTES
M3	Lamp		#47
M4	Switch	19B592	Compensation and Phono-Tuner (Rotary Wafer Type)

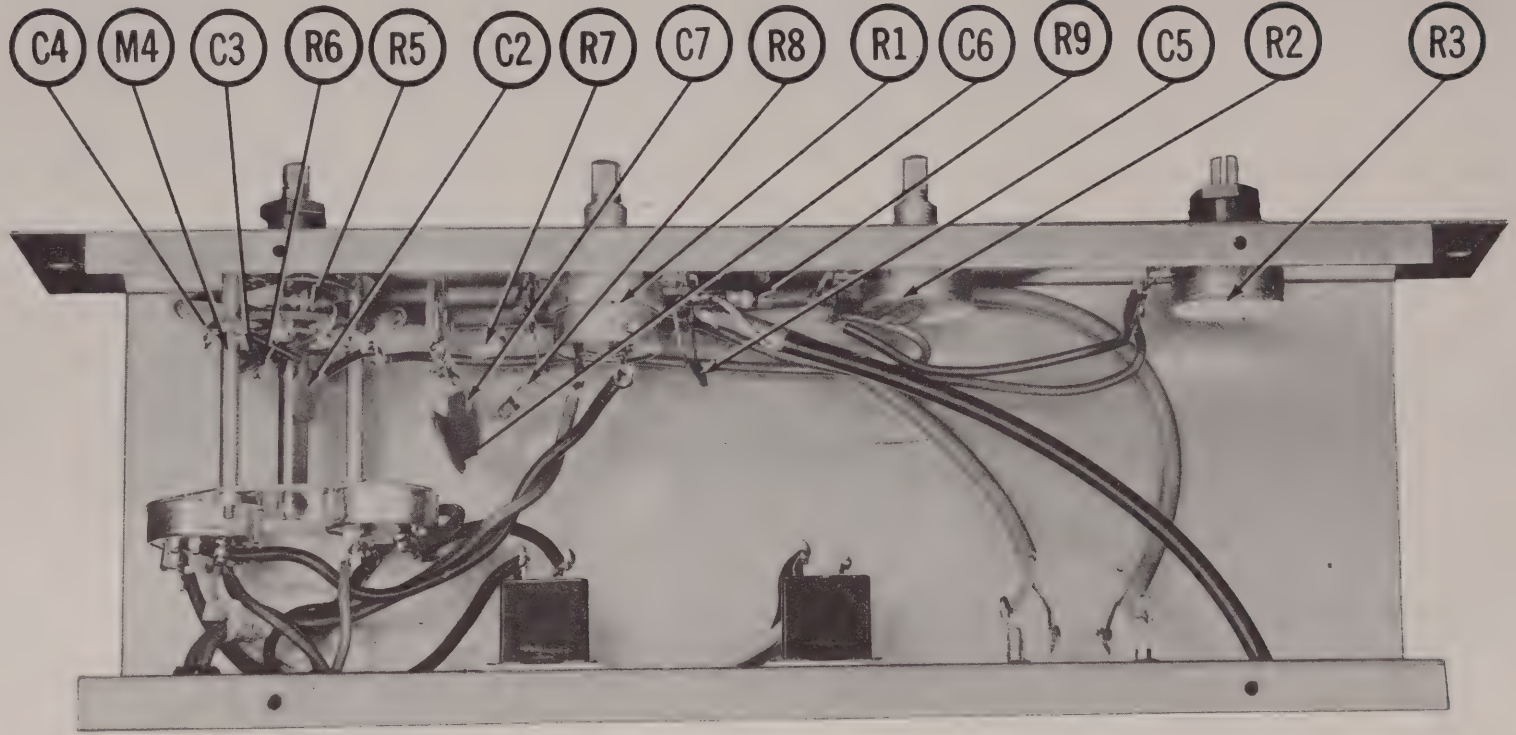
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

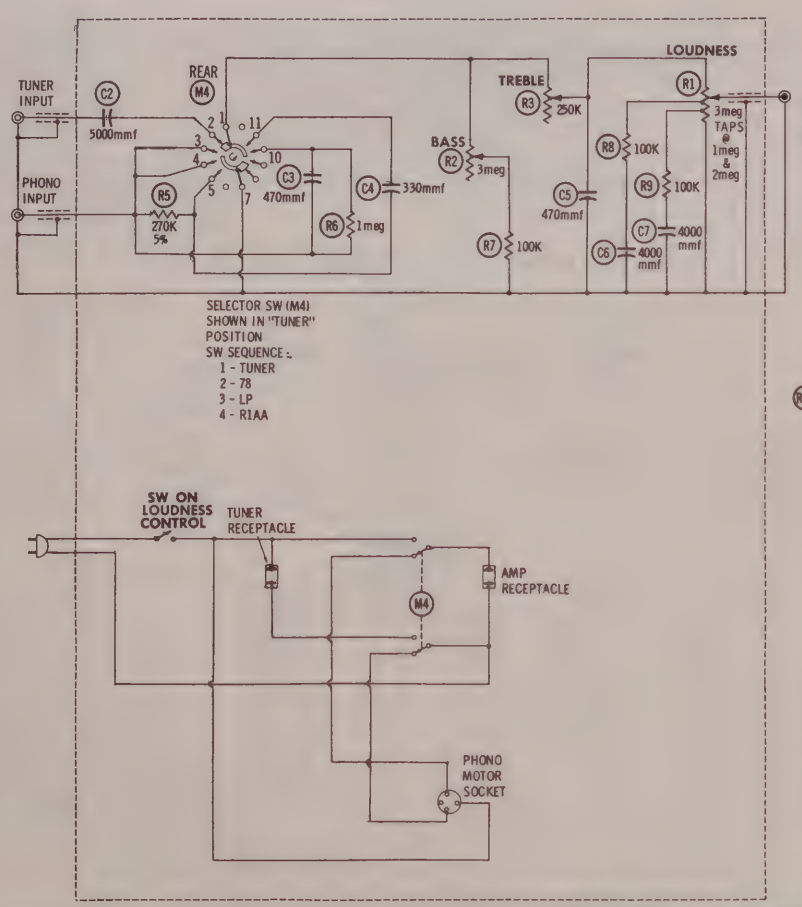
NAME	PART NO.	DESCRIPTION
Knob	8B483	Four used
Cabinet	17B981	Mahogany, Model 534
Cabinet	17B982	Blond, Model 534
Cabinet	17B983	Walnut, Model 534
Cabinet	17B984	Walnut, Model 705

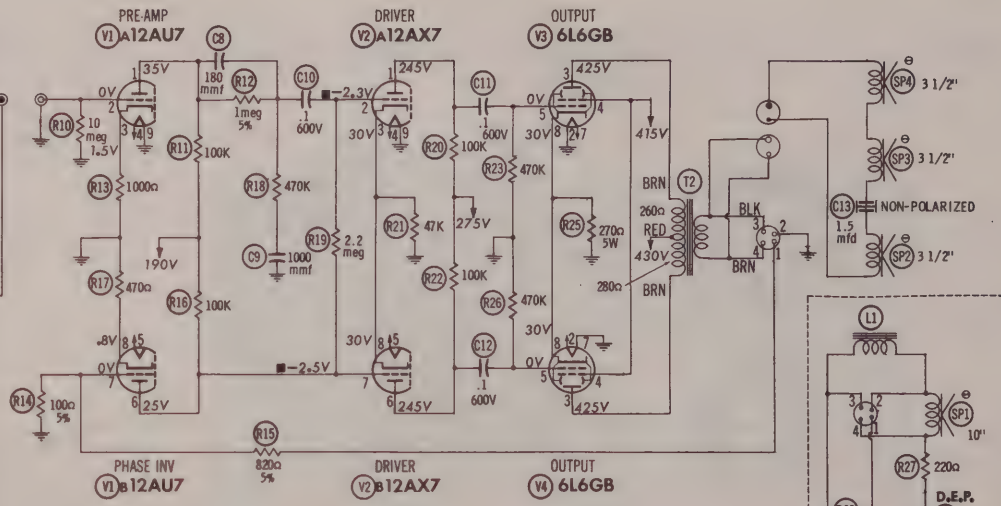
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

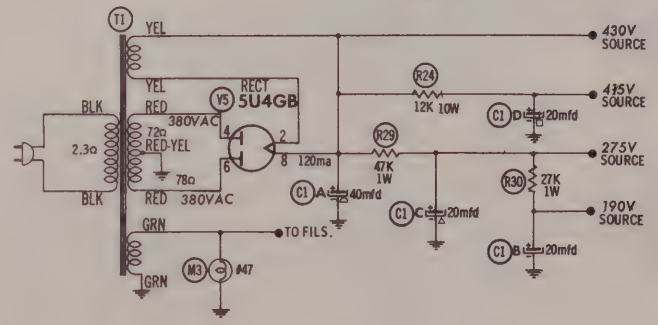


CONTROL CHASSIS - BOTTOM VIEW





D. E. P. ADJUSTMENT (R4)
1. Remove speaker plug.
2. Connect 3volts DC across pins 3 & 4.
3. Connect a DC milliameter across pins 1 & 2.
4. Accurately adjust R4 for a zero meter reading.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7	†175K	0Ω	1000Ω	.1Ω	.1Ω	†175K	100Ω	470Ω	0Ω
V2	12AX7	†147K	†2.3meg	47K	.1Ω	.1Ω	†147K	†175K	47K	0Ω
V3	6L6GB	NC	0Ω	†260Ω	†12K	470K	NC	.1Ω	270Ω	
V4	6L6GB	NC	.1Ω	†280Ω	†12K	470K	NC	0Ω	270Ω	
V5	5U4GB	NC	20K(Min)	NC	72Ω	NC	78Ω	NC	20K(Min)	

† MEASURED FROM PIN 8 OF V5
■ MEASURED FROM PIN 3 OF V2
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

PHOTOFACT* Folder

EIA

EMERSON MODEL 867B (Ch. 120366B)

EMERSON MODEL 867B (Ch. 120366B)

TRADE NAME	Emerson Model 867B (Ch. 120366B)
MANUFACTURER	Emerson Radio & Phono Corp., 14th & Coles Sts. Jersey City 2, N. J.
TYPE SET	AC Operated AM Receiver with 4 Speed Automatic Record Changer
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AT6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60Cycle
RATING	.27 Amp. @117 Volts AC (25 Watts)
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B—.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.005mfd	High side to Pin 7 (grid) of 12BE6 (V1) Low side to chassis	455KC (400~ Mod.)	Tuning gang fully open.	Across Voice Coil	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001mfd to reduce hum modulation.
2.	Direct	Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	"	1400KC	Tune to 1400 KC signal	"	A6	"

FOR SERVICE INFORMATION ON RECORD CHANGER—SEE SIMILAR V-M 1200A—PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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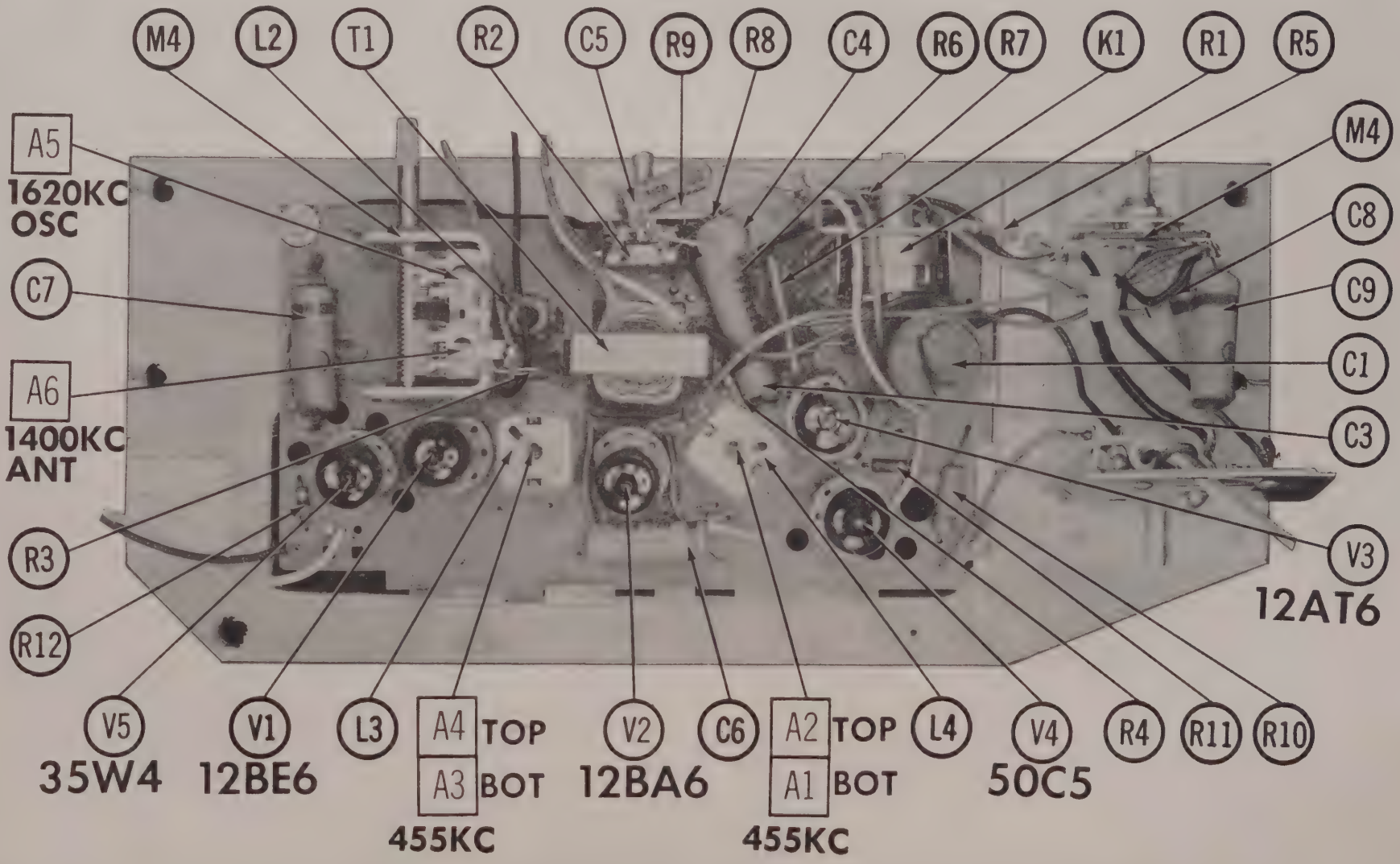


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS
TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AT6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	Emerson PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	925403 ①	PRS150V8040	BBRD8415	TCD49	TDLD-11	FMD-303	R1441*
B	40	150							
C2	4	15NP	925391	NP-PRS50V4	BBR8-150 † BBR8-150 †	TC41 † TC41 †	TD-8-150 † TD-8-150 †	MT-1508 † MT-1508 †	R2444*

① Alternate Part #925382 † Connect Negative Leads Together * Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	Emerson PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	.047	400	923554	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C4	.047	400	923554	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C5	0047	400	923553	P488N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C6	.022	400		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C7	.047	400	923554	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C8	.047	400	923554	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C9	.047	400	923554	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	Emerson PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	2meg	½	390473					
R2A	500K	½	390474	B-59	A47-500K-Z	Q11-133	U50	Volume & Switch
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	Tone

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Emerson PART No.	NOTES
R3	22K			
R4	120Ω			
R5	680K			
R6	2.2meg			
R7	820Ω		360472	
R8	2200Ω		340572	
R9	3300Ω		340612	
R10	1500Ω	1		
R11	150Ω			
R12	18Ω		340072	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	Emerson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2100Ω	6-8Ω	734149							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	Emerson PART No.	QUAM PART No.	NOTES
SP1	8"	PM	6-8Ω	180165	8A6	
SP2	3½"	PM	3-4Ω	180164	3A07	
SP3	3½"	PM	3-4Ω	180164	3A07	

PARTS LIST AND DESCRIPTIONS (Continued)
COILS (RF-IF)

ITEM No.	USE	Emerson PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loop Ant.	700125					
L2	Osc. Coil	716108					
L3	Input IF	720259	16-6780	BC-356	13-PC1	RF-4	
L4	Output IF	720259	16-6780	BC-357	13-PC2	RF-4	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Emerson PART No.	REPLACEMENT DATA
K1	Audio Coup. Net.	220mmf, 500mmf, 2000mmf 5000mmf 470K, 470K, 6.8meg	923041	

PHONO CARTRIDGE

ITEM No.	Emerson PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1	961865 ①	55-T or 81-TB	GD-J	56	PT-2	①Includes Needle

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	Emerson PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	960827	† S-66 or †♦ S-66SD or ♦ S-66D	† W-75TPS or †♦ W-75DS or ♦ W-75TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	Emerson PART No.	NOTES
M3	Lamp	807000	#47
M4	Tuning Cap.	900159	Two Gang (Ant. 20-295mmf)
M5	Switch	510119	Phono-Radio (Rotary Wafer Type)
	Printed Board	630210	

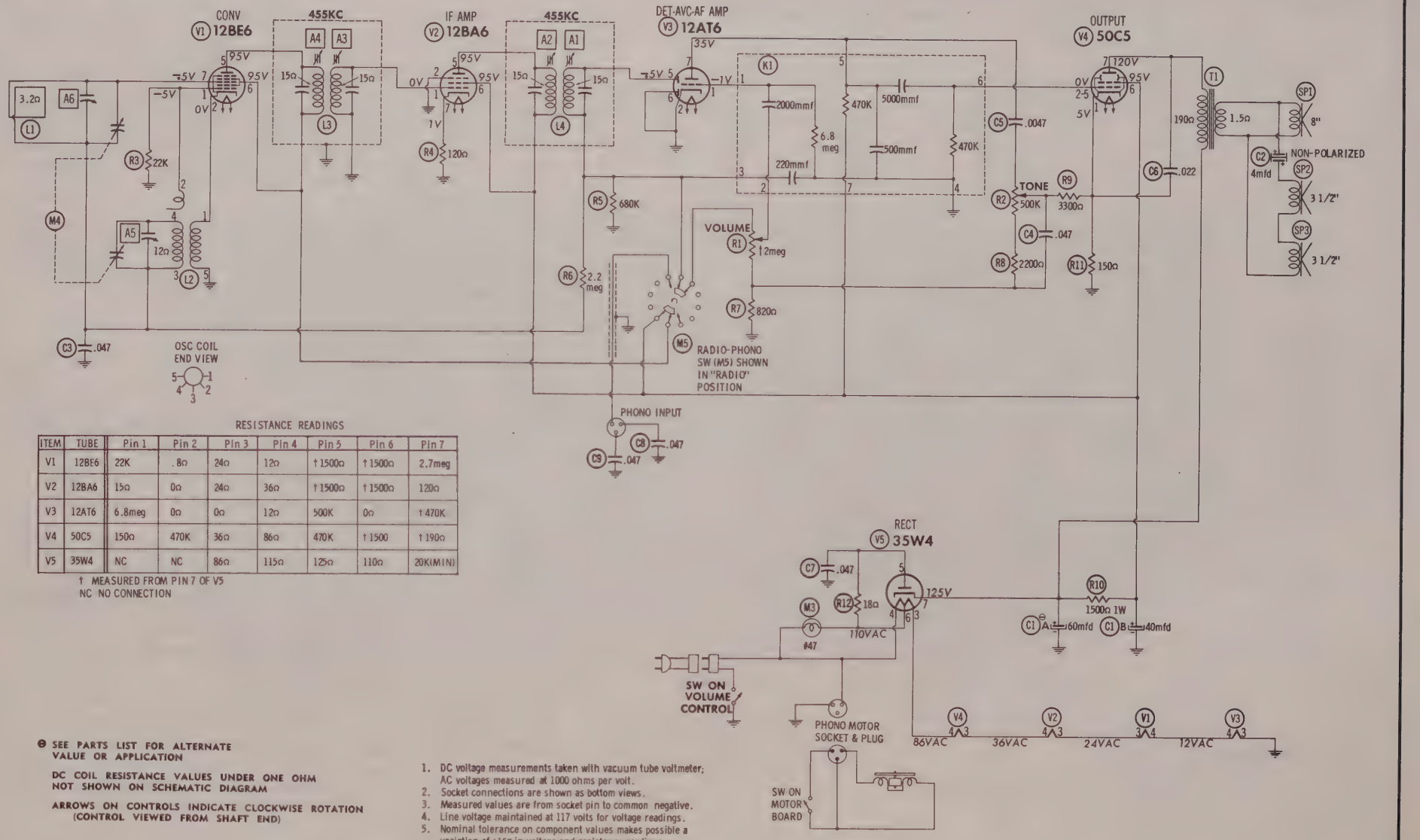
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	961842	Control, Changer
Knob	460872	Control
Knob	460865	Phono-Radio
Knob	460866	Tuning
Cabinet	140840	Mahogany
Cabinet	140840A	Blonde
Cabinet	140840B	Walnut

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.8Ω	24Ω	12Ω	†1500Ω	†1500Ω	2.7meg
V2	12BA6	15Ω	0Ω	24Ω	36Ω	†1500Ω	†1500Ω	120Ω
V3	12AT6	6.8meg	0Ω	0Ω	12Ω	500K	0Ω	†470K
V4	50C5	150Ω	470K	36Ω	86Ω	470K	†1500	†190Ω
V5	35W4	NC	NC	86Ω	115Ω	125Ω	110Ω	20K(MIN)

† MEASURED FROM PIN 7 OF V5
NC NO CONNECTION

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

Howard W. Sams & Co., Inc. 1958

PHOTOFACT* Folder

FIRESTONE MODELS 4-A-166 (Code 1-7-5T10), 4-A-168 (Code 1-7-5C8)

FIRESTONE MODELS 4-A-166 (Code 1-7-5T10), 4-A-168 (Code 1-7-5C8)

FIRESTONE MODELS 4-A-166 (Code 1-7-5T10), 4-A-168 (Code 1-7-5C8)

TRADE NAME	Firestone Models 4-A-166 (Code 1-7-5T10), 4-A-168 (Code 1-7-5C8)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	AC Operated AM Receiver (Model 4-A-168 is Clock Version)
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycle
RATING	.265 Amp. @117 Volts AC (24 Watts Less Clock)
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B—. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of 12BE6 (V1). Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across Voice Coil	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001mfd to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.	Direct	Loop	1400KC	Tune to 1400 KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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H529

SET 407 FOLDER 7

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

FIRESTONE MODEL 4-A-166

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Firestone PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	70	150	582008	PRS150V8040	BBRD8415	WD220	TMD-16	FMD-303	TVA-2460
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Firestone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	10		515012	N750-S110	TCN-10	CTA6Q1U	NT-541	5TCU-Q1	N750
C3	.05	200		P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C4	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C5	.05	400		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C6	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Firestone PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	361880	B-70	A47-1meg-Z	Q13-137	U53	Volume Note 1
B	Shaft			Not Req.	KSS -3	Not Req.	Not Req.	

Note 1. Control with Switch used in Model 4-A-166 (Part # 361881)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Firestone PART No.	NOTES
R2	22K			
R3	220Ω			
R4	2.2meg			
R5	150Ω	1		
R6	2200Ω	1		

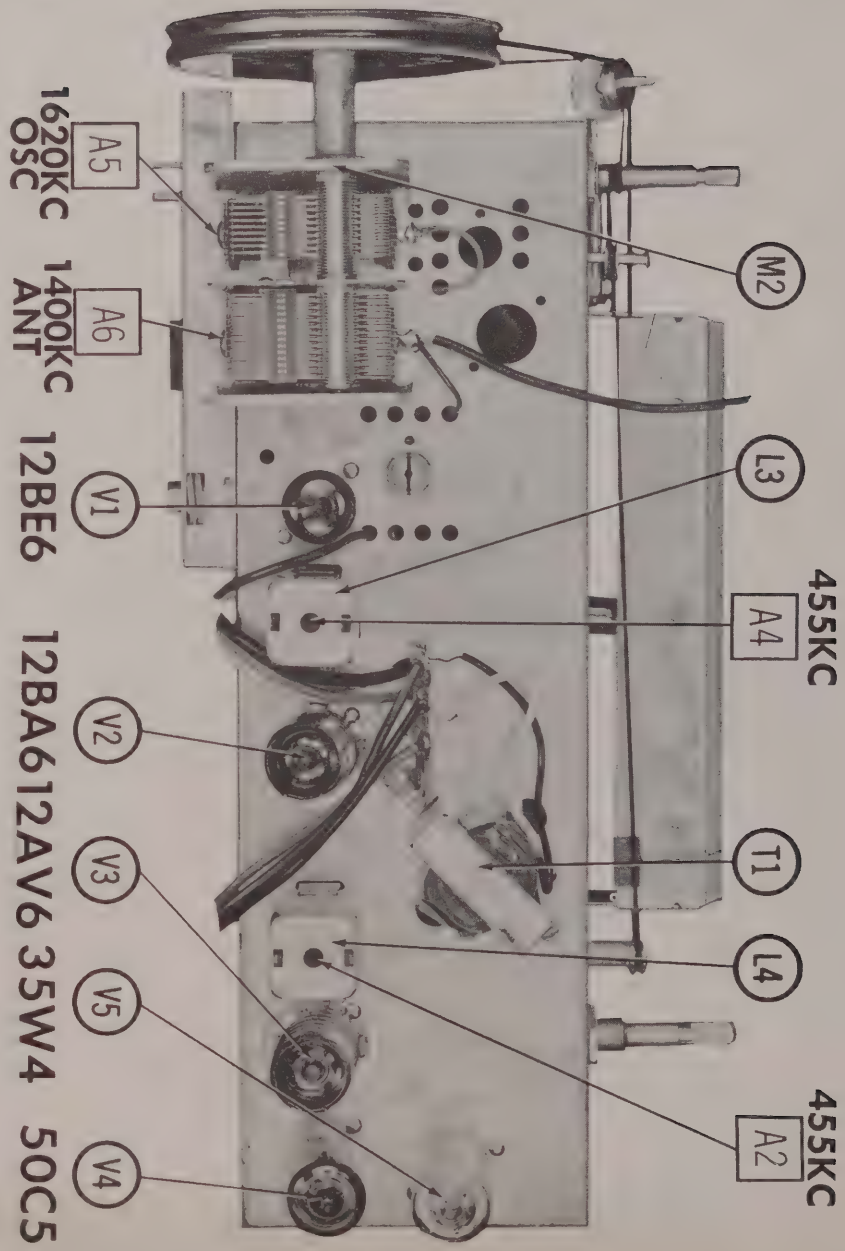
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Firestone PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2500Ω	1-2Ω	430241	Z1001①	A-2902①	AU-604①	A-3849①	24S84 ①		①Drill New Mounting Hole

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Firestone PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	404015 ①	4A1	①Parallel and Phase
SP2	4"	PM	3-4Ω	404015 ①	4A1	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		Firestone PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loop Ant.	460021					Note 1.
	Loop Ant.	460018					Note 2.
L2	Osc. Coil	455064	14-1073	BC-393	69-Osc.		
L3	Input IF	450023	16-6758	BC-352	12-C9	RF-1	
L4	Output IF	450023	16-6758	BC-353	12-C10	RF-2	

Note 1. Includes cabinet back Model 4-A-168
Note 2. Includes cabinet back Model 4-A-166

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Firestone PART No.	REPLACEMENT DATA	
K1	Audio Coup. Net.	5000mmf, 220mmf, 5000mmf 250mmf, 6.8meg, 470K, 470K	420006	Aerovox	PA-113-2
				Centralab	PC-151
				Cornell-Dubilier	116TM2
				Sprague	DT-2

MISCELLANEOUS

ITEM No.	PART NAME	Firestone PART No.	NOTES
M1	Lamp	355001	#47
M2	Tuning Cap.	590046	Two Gang (Ant. 28-507mmf, Osc. 22-187mmf)
	Clock	384010	Dark Face
	Clock	384009	White Face

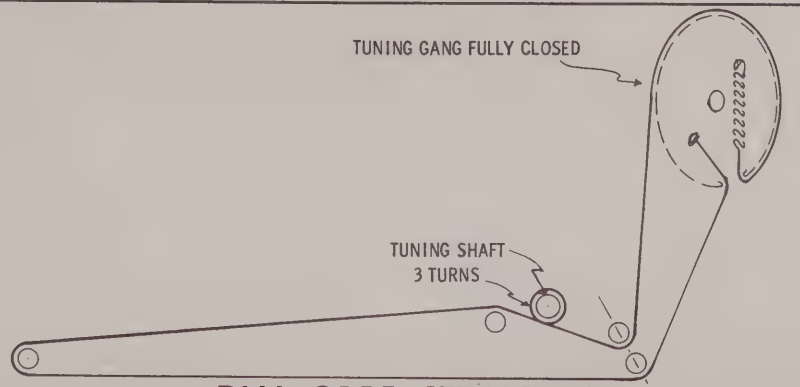
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	272209	Volume, Tuning
Knob	272210	Clock, Model 4-A-168
Cabinet	250110	White, Model 4-A-168
Cabinet	250112	Charcoal, Model 4-A-168
Cabinet	250120	White, Model 4-A-166
Pointer	674033	
Clock Crystal	260048	Model 4-A-168

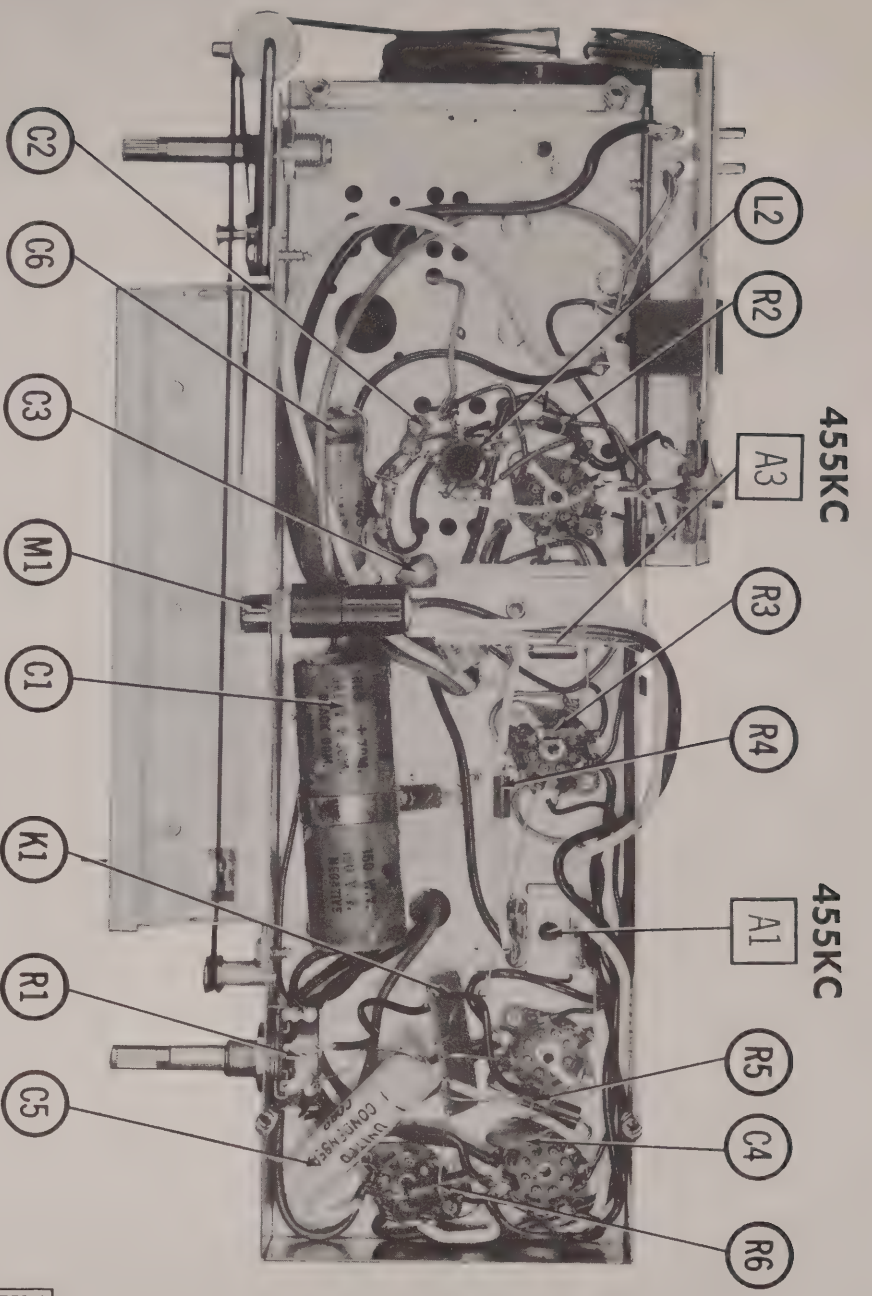
WIRING DATA

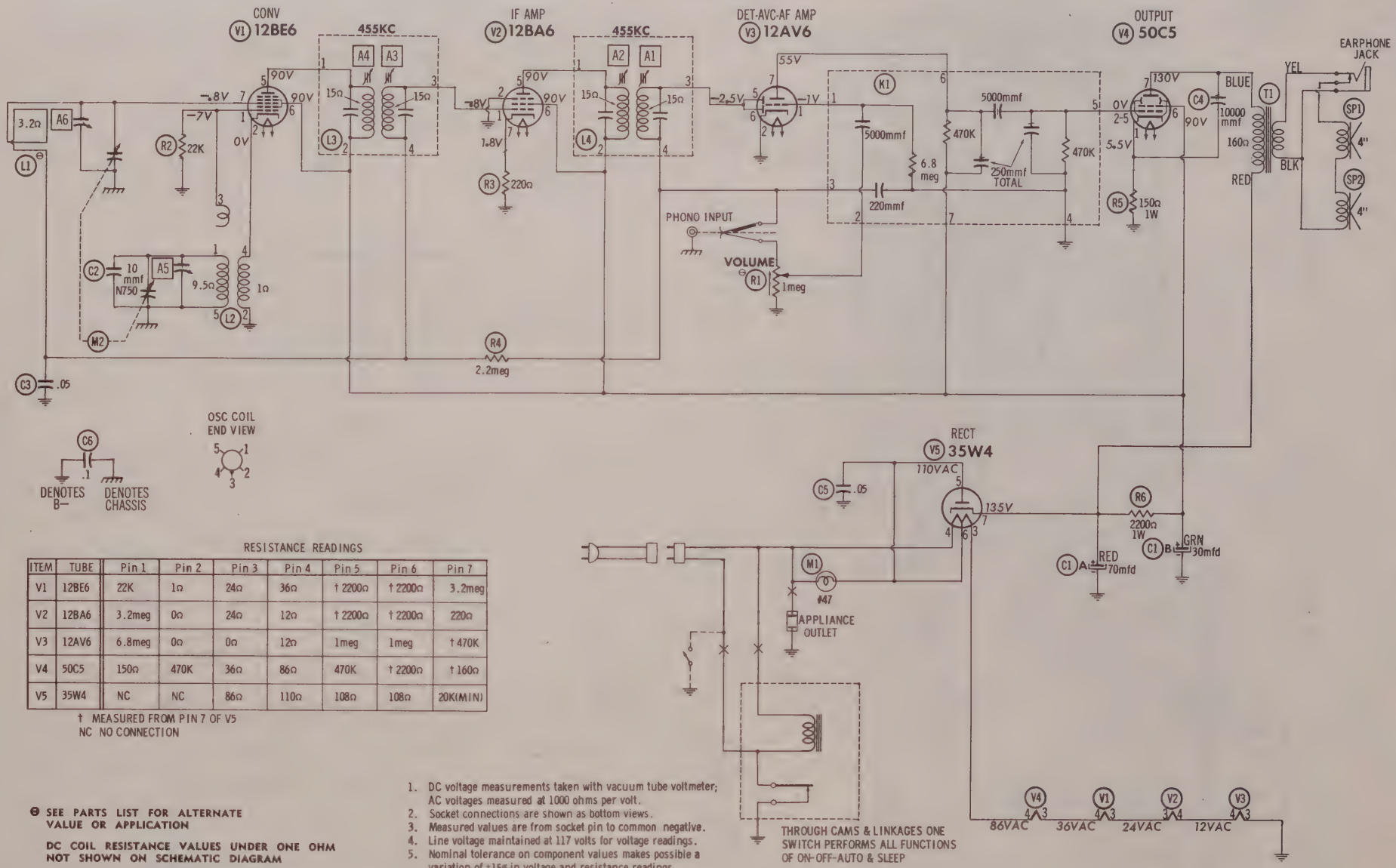
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type) ..... Use BELDEN No. 8874



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	1Ω	24Ω	36Ω	† 2200Ω	† 2200Ω	3.2meg
V2	12BA6	3.2meg	0Ω	24Ω	12Ω	† 2200Ω	† 2200Ω	220Ω
V3	12AV6	6.8meg	0Ω	0Ω	12Ω	1meg	1meg	† 470K
V4	50C5	150Ω	470K	36Ω	86Ω	470K	† 2200Ω	† 160Ω
V5	35W4	NC	NC	86Ω	110Ω	108Ω	108Ω	20K(MIN)

† MEASURED FROM PIN 7 OF V5
NC NO CONNECTION

Ⓔ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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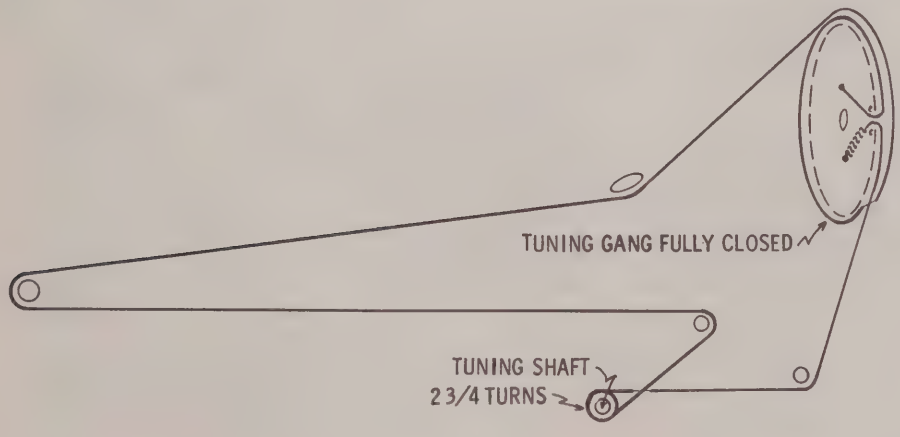
*TRADE MARK

FISHER
MODEL FM-90X

FISHER
MODEL FM-90X

FISHER
MODEL FM-90X

TRADE NAME	Fisher Model FM-90X
MANUFACTURER	Fisher Radio Corp., 21-21 44th Drive, Long Island City 1, N. Y.
TYPE SET	AC Operated FM Tuner
TUBES (Nine)	Types V50064, RF Amplifier, 6BK7A Mixer-Osc., 6BH6 1st IF Amplifier, 6BH6 2nd IF Amplifier, 6AM8 3rd IF Amp.-Squelch Diode, 12AX7 Squelch Amp.-AF Amp., 6BH6 Limiter, 12AU7 AF Amp.-Meter Amp., 6X4 Rectifier
POWER SUPPLY	105-125 Volts AC - 50/60 Cycles RATING .46 Amp. @ 117 Volts AC (46 Watts)
TUNING RANGE—FREQ.MOD.	88 - 108MC



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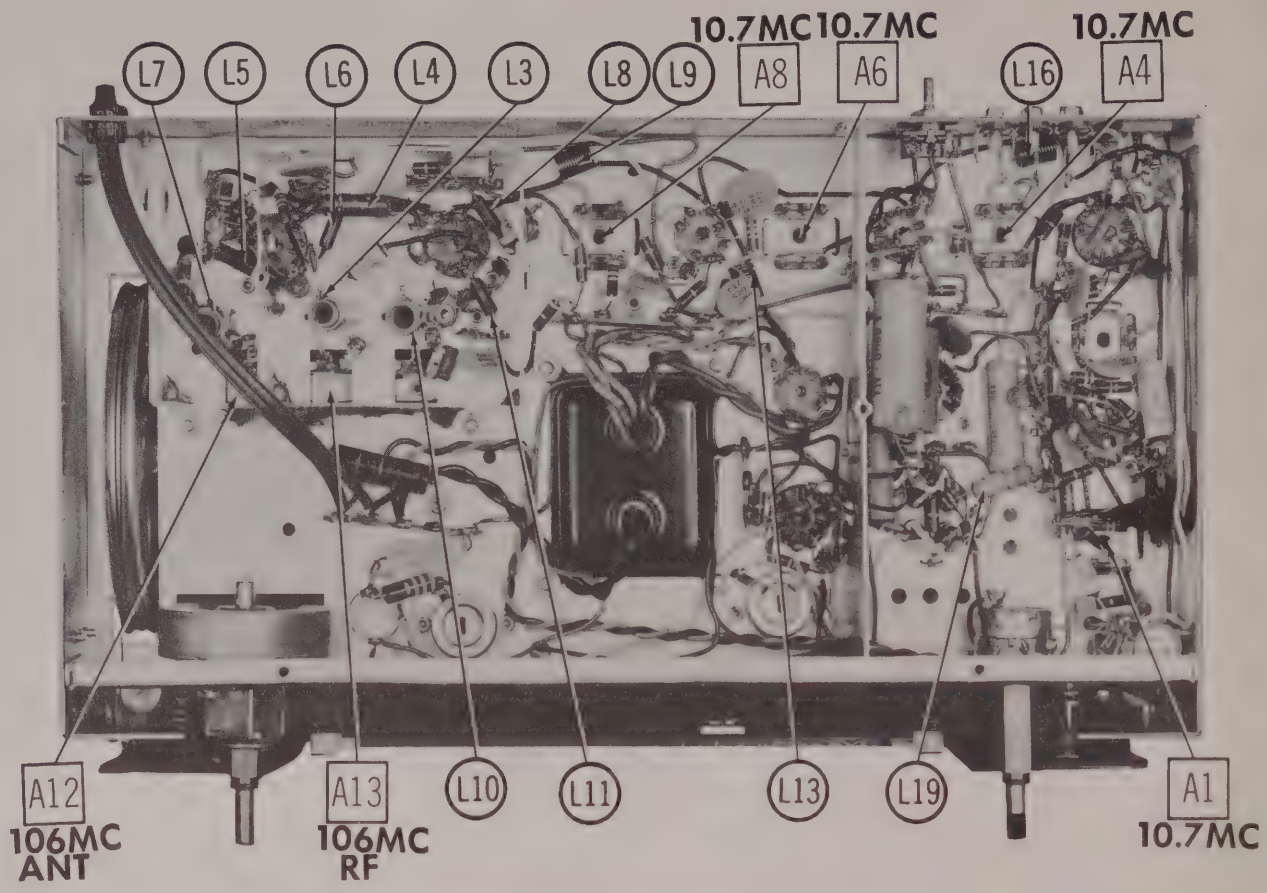
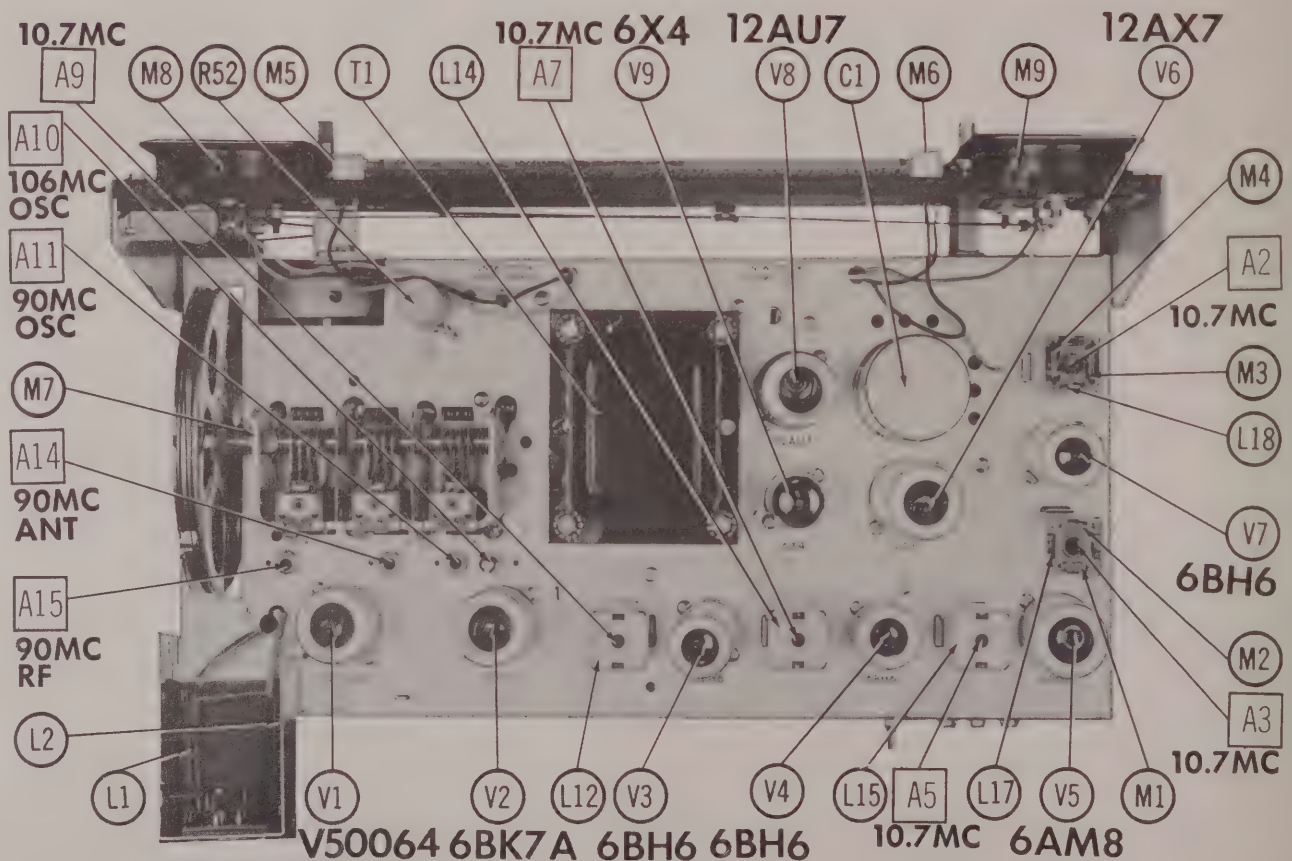
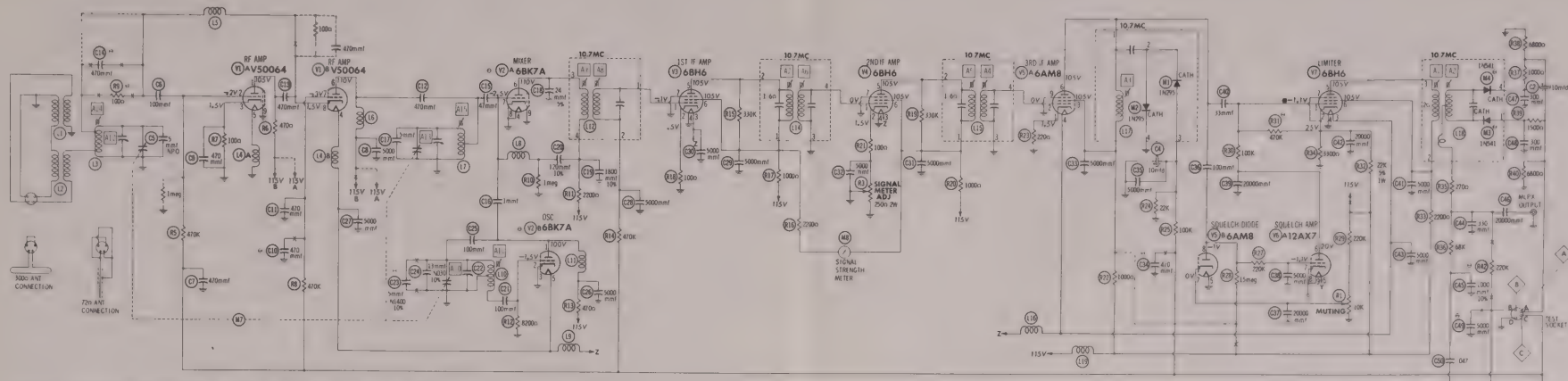
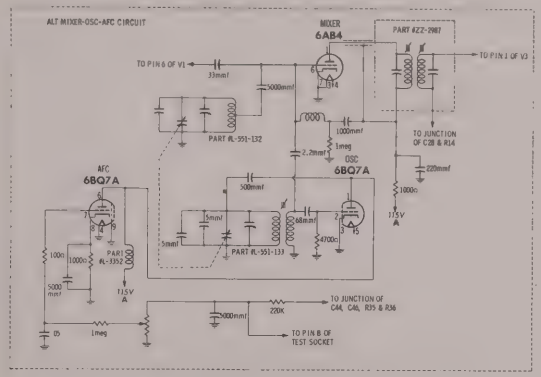


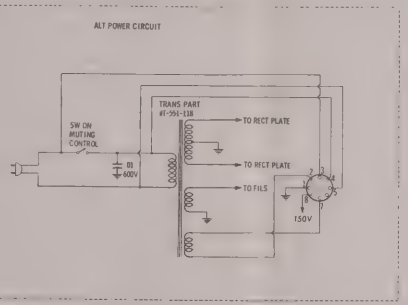
CHASSIS BOTTOM VIEW- INDUCTOR AND ALIGNMENT IDENTIFICATION

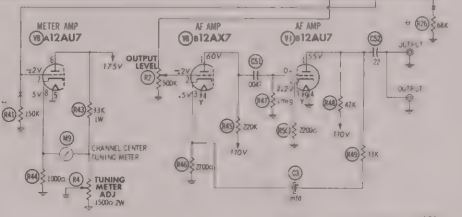


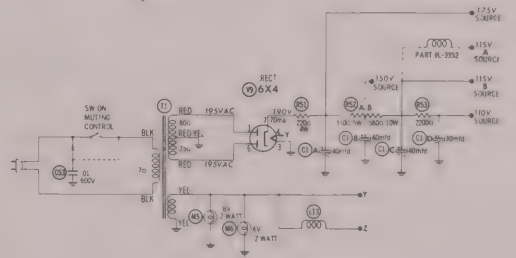
CHASSIS TOP VIEW











RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	V50064	†1700Ω	530K	100Ω	1Ω	∞	†1200Ω	530K	100Ω	0Ω
V2	6BK7A	†1700Ω	8200Ω	0Ω	1Ω	1Ω	†3300Ω	1meg	0Ω	0Ω
V3	6BH6	530K	100Ω	1Ω	0Ω	†2100Ω	†2100Ω	0Ω		
V4	6BH6	4Ω	370Ω	1Ω	0Ω	†2100Ω	†2100Ω	0Ω		
V5	6AM8	220Ω	4Ω	†2100Ω	1Ω	0Ω	†2100Ω	0Ω	15meg	0Ω
V6	12AX7	†220K	240K	2700Ω	1Ω	1Ω	370K	15meg	0Ω	0Ω
V7	6BH6	470K	3300Ω	1Ω	0Ω	†3300Ω	†3300Ω	3300Ω		
V8	12AU7	†51K	1meg	2200Ω	0Ω	0Ω	†220Ω	90K	600Ω	1Ω
V9	6X4	800	NC	0Ω	1Ω	NC	75Ω	20KMint		

† MEASURED FROM PIN 7 OF V9
= MEASURED FROM PIN 2 OF V7
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measures values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

407-8

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Set muting control to MINIMUM.
With tuning capacitor fully closed, set dial pointer to zero mark on logging scale.

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01mfd	High side to pin 1 (grid) of 6BH6 (V7). Low side to chassis.	10.7MC (Unmod)	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	"	"	DC probe to point Ⓑ. Common to chassis.	A2	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
3.		High side to ungrounded tube shield on 6BK7A (V2). Low side to chassis.	"	"	DC probe to point Ⓒ. Common to chassis.	A3, A4, A5, A6, A7, A8, A9	Adjust for maximum deflection.

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	.01mfd	High side to pin 1 (grid) of 6BH6 (V7). Low side to chassis.	10.7MC (450KC Swp)	Point of non-interference	Vert. Amp. to point Ⓐ. Low side to chassis.	A1	Disconnect stabilizing capacitor (C2). Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
2.	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A2	Reconnect C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.
3.		High side to ungrounded shield (V2). Low side to chassis.	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A3, A4, A5, A6, A7, A8, A9	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.

RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	Two 120Ω Carbon Resistors	To antenna leads with 120Ω in each side.	106MC (Unmod)	106MC	DC probe to point Ⓒ. Common to chassis.	A10	Adjust for maximum deflection.
5.	"	"	90MC	90MC	"	A11	"
6.	"	"	106MC	106MC	"	A12, A13	"
7.	"	"	90MC	90MC	"	A14, A15	Adjust for maximum deflection. Repeat steps 4 thru 7.

FIG. 1

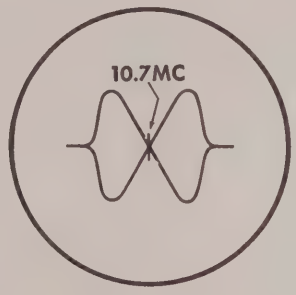
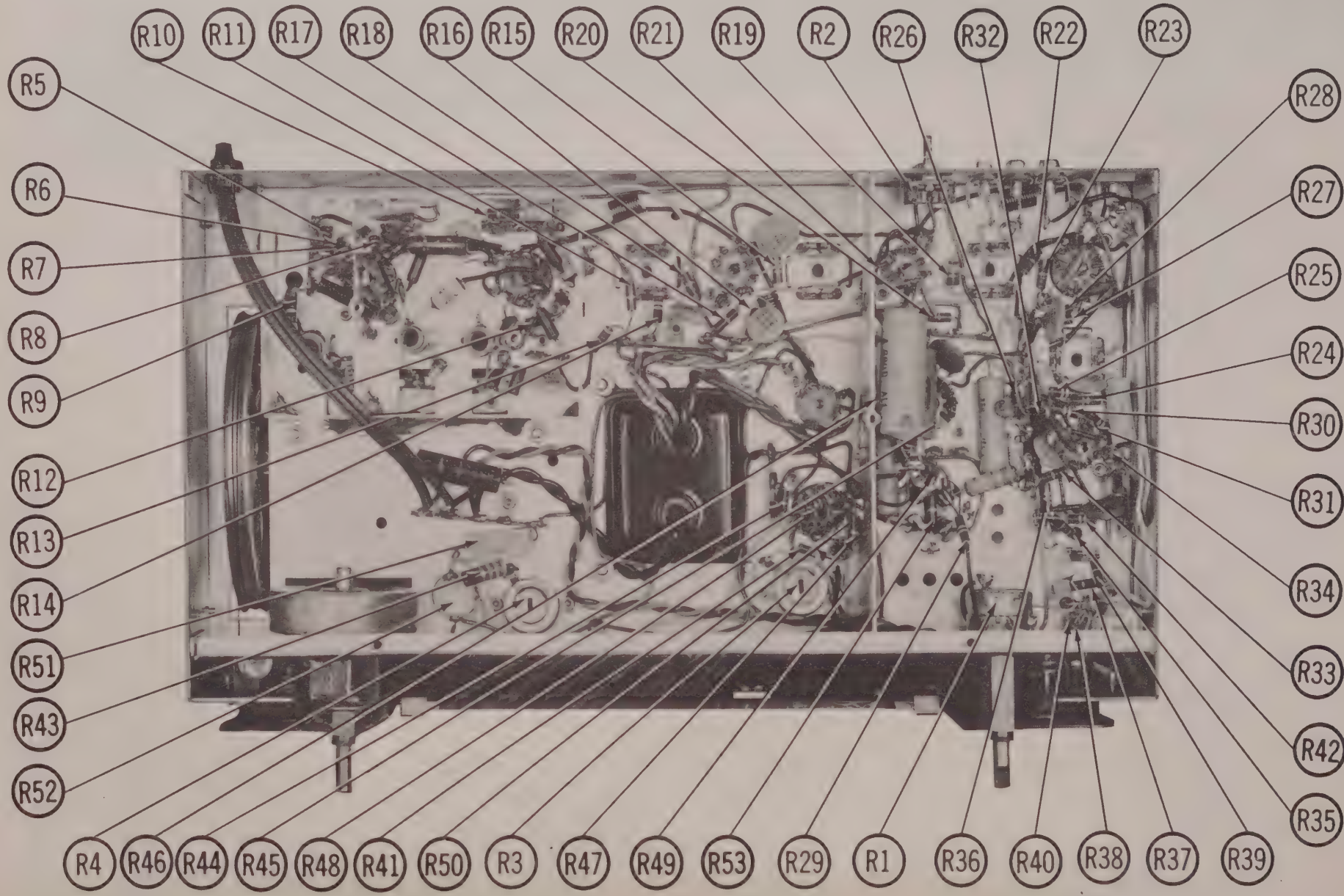


FIG. 2



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	V50064	
V2	Mixer-Oscillator	6BK7A	Note 1
V3	1st IF Amplifier	6BH6	
V4	2nd IF Amplifier	6BH6	
V5	3rd IF Amp.-Squelch Diode	6AM8	
V6	Squelch Amp.-AF Amp.	12AX7	
V7	Limiter	6BH6	
V8	AF Amp. - Meter Amp.	12AU7	
V9	Rectifier	6X4	

Note 1. In some versions, the mixer is a 6AB4. A 6BQ7A is used for the oscillator-AFC tube.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FISHER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	250	C550-130	AFH4-04-50	D0034	FP420.38	TMQ-120	Q-012	TVL-4635.3
B	■40	200							
C	▲40	200							
D	30	200							
C2	10	50	C551-128	PRS50V10	BBR10-50	TC32	TD-10-50	MT-0510	TVA-1304
C3	1	250	C546-126	PRS450V1	BR145	TT250X1		MMT-4501	R2622 *
C4	10	50	C551-146	PWE50010	NL10-50	TT50X10	ML10-50	MMT-0510	TE-1304

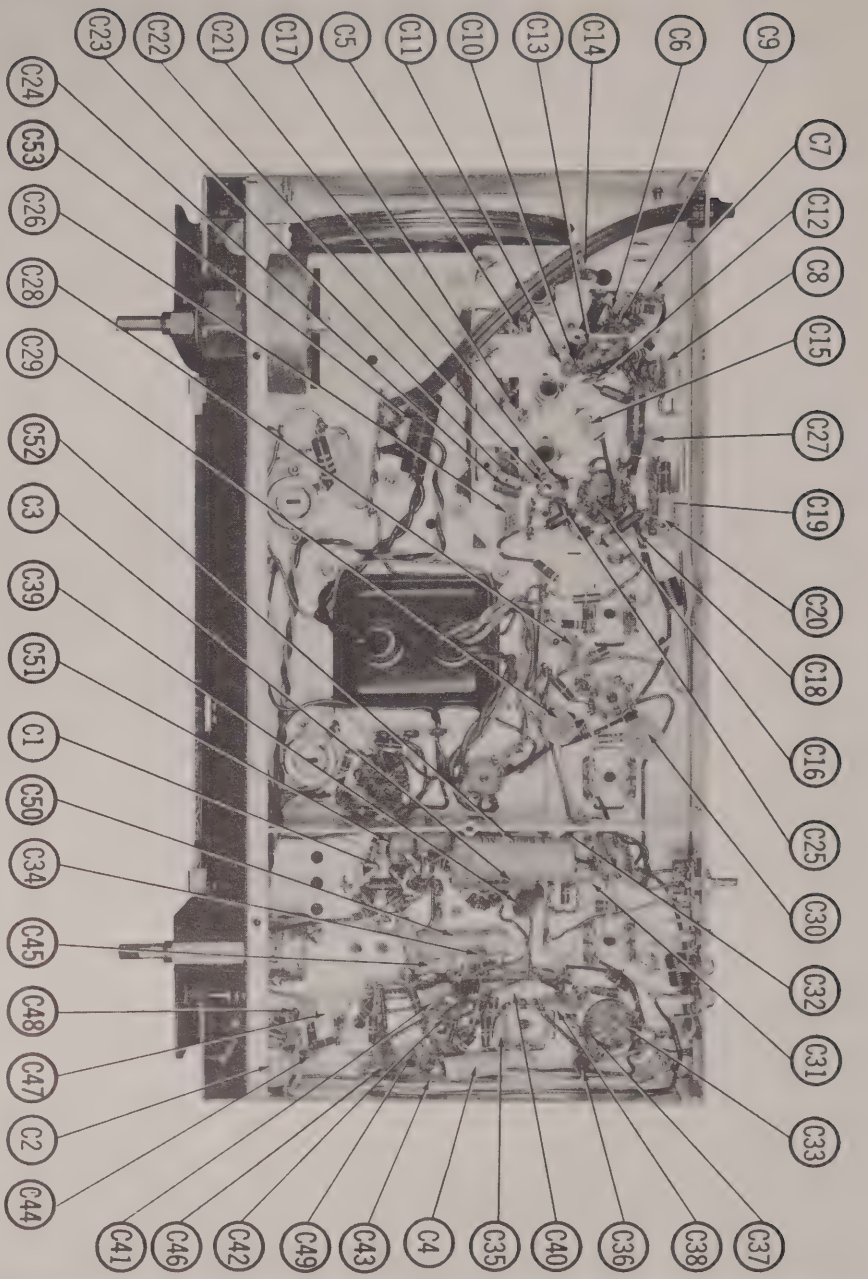
* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	5	500	CC20CH050F5	NPO-SI 5	TCZ-4R7	CTA6V47C	ZT-555	5TCCB-V47	NPO
C6	100	600	C-577-121	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C7	470	500	C-520-143	BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C8	5000	600	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C9	470	500	C-520-143	BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C10	470	500	C-520-143	BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	①
C11	470	500	C-520-143	BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C12	470	500	C-520-143	BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C13	470	500	C-520-143	BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C14	470	500	C-520-143	BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	①
C15	47	500	CC21GP470M5	SI 47	D6-470	L10Q47	UC-5447	5GA-Q47	
C16	1		C-1786	NPO-SI 1	TCZ-1			5TCCB-V1	
C17	5	500	CC20CH050F5	NPO-SI 5	TCZ-4R7	CTA6V47C	ZT-555	5TCCB-V47	NPO
C18	24	500	CC21GP240J5		TCZ-24				5%
C19	1800	500	CC26GP182K5						10%
C20	120	500	CC21GP121K5	NPO-SI 120	D6-121	CTA6T12C		5TCC-T12	10%
C21	100	600	C-577-121	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C22									
C23	5	500	CC20VK050F5						N1400 10% ②
C24	13	500	CC20HG130K5						N030 10% ②
C25	100	600	C-577-121	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C26	5000	600	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C27	5000	600	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C28	5000	600	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C29	5000	600	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C30	5000	600	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C31	5000	600	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C32	5000	600	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C33	5000	600	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C34	470	500	C-520-143	BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	①
C35	5000	600	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C36	100	600	C-577-121	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C37	20000	600	C-556-122	BPD-02	DD-203	BYA10S2		5HK-S2	
C38	5000	600	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C39	20000	600	C-556-122	BPD-02	DD-203	BYA10S2		5HK-S2	
C40	33	500	CC21GP330M5	SI 33	D6-330	LT6Q33	UC-5433	5GA-Q33	
C41	5000	600	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C42	20000	600	C-556-122	BPD-02	DD-203	BYA10S2		5HK-S2	
C43	5000	600	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C44	300	500	CC21GP301M5	SI 300	D6-301	LT6T3	UC-533	5GA-T3	
C45	1000	500	CC21GP102K5						10%
C46	20000	600	C-556-122	BPD-02	DD-203	BYA10S2		5HK-S2	

CHASSIS BOTTOM VIEW



FISHER MODEL FM-90X

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C47	300	500	CC21GP301M5	SI 300	D6-301	LT6T3	UC-533	5GA-T3	
C48	300	500	CC21GP301M5	SI 300	D6-301	LT6T3	UC-533	5GA-T3	
C49	5000	600	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	①
C50	.047	200	C68P473M2	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C51	.0047	200	C68P472M2	P288N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C52	.22	200	C68P224V2	P288N-22		CUB2P22	GEM-2022	2TM-P22	
C53	.01	600	C-2747	P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	

① Not used in some versions.
② Chassis with serial numbers 10001-19999 use three 5mmf capacitors in parallel: N1400 (Part #CC20VK050F5), N330 (Part #CC20SK050F5), NPO (CC20CH050F5). Chassis with serial numbers 30001-39999 use 5mmf N750 (Part #CC20UJ050F5) and 13mmf N030 (Part #CC20HG130K5) in parallel.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FISHER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	10K	½	R551-182	B-14	A47-10K-S	Q11-116	U20	Muting
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	Power On-Off
R2	500K	½	R520-139	JP-504				Output Level
R3	250Ω	2(WW)	R550-135-2		39-300		FL-250	Signal Meter Adj.
R4	1500Ω	2(WW)	R520-149		39-1500		FL-1.5K	Tuning Meter Adj.

* Use KR with CRL "red label" controls and KB with "blue label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	FISHER PART No.	NOTES
R5	470K		RC20BF474K	
R6	470Ω		RC20BF471K	
R7	100Ω		RC20BF101K	
R8	470K		RC20BF474K	
R9	100Ω		RC20BF101K	Note 1
R10	1meg		RC20BF105K	
R11	2200Ω		RC20BF222K	
R12	8200Ω		RC20BF822K	
R13	470Ω		RC20BF471K	
R14	470K		RC20BF474K	
R15	330K		RC20BF334K	
R16	2200Ω		RC20BF222K	
R17	1000Ω		RC20BF102K	
R18	100Ω		RC20BF101K	
R19	330K		RC20BF334K	
R20	1000Ω		RC20BF102K	
R21	100Ω		RC20BF101K	
R22	1000Ω		RC20BF102K	
R23	220Ω		RC20BF221K	
R24	22K		RC20BF223K	
R25	100K		RC20BF104K	
R26	68K		RC20BF683K	Note 1
R27	220K		RC20BF224K	
R28	15meg		RC20BF156K	
R29	220K		RC20BF224K	

ITEM No.	RATING OHMS	RATING WATT	FISHER PART No.	NOTES
R30	100K		RC20BF104K	
R31	470K		RC20BF474K	Note 2
R32	22K 5%	1	RC30BF223K	
R33	2200Ω		RC20BF222K	
R34	3300Ω		RC20BF332K	
R35	270Ω		RC20BF271K	
R36	68K		RC20BF683K	
R37	1000Ω		RC20BF102K	
R38	6800Ω		RC20BF682K	
R39	1500Ω		RC20BF152K	
R40	6800Ω		RC20BF682K	
R41	150K		RC20BF154K	Note 1
R42	220K		RC20BF224K	Note 1
R43	33K	1	RC30BF333K	
R44	1000Ω		RC20BF102K	
R45	220K		RC20BF224K	
R46	2700Ω		RC20BF272K	
R47	1meg		RC20BF105K	
R48	47K		RC20BF473K	
R49	33K		RC20BF333K	
R50	2200Ω		RC20BF222K	
R51	220Ω	4(WW)	R-551-137	
R52A	330Ω	5(WW)		
B	580Ω	10(WW)	R-551-138	
R53	2200Ω		RC20BF222K	

Note 1. Not used in some versions.

Note 2. Some versions may use 560K in this application (Part #RC20BF564K).

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA FISHER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	117V ⓖ .46A	375VCT ⓖ .070A	6.3V ⓖ 3.2A	T-630-113						

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA FISHER PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Ant. Matching Coil	L-509-139	15-1082	TV-172	6202	BC-501	
L2	Ant. Matching Coil	L-509-139	15-1082	TV-172	6202	BC-501	
L3	Antenna Coil	L-551-131					
L4	Fil. Choke	L-509-140	19-1002 *	BC-563 *	4606 *		* Use two.
L5	Neutr. Coil	L-520-178	19-1002	BC-563	4606		2 Microhenries
L6	RF Choke	L-50066-6	19-1002	BC-563	4606		2.2 Microhenries
L7	RF Coil	L-551-187					
L8	RF Choke	L-50066-6	19-1002	BC-563	4606		2.2 Microhenries
L9	Fil. Choke	L-520-156	19-1000	BC-561	4602		1.25 Microhenries
L10	Osc. Coil	L-551-191					
L11	RF Choke	L-50066-6	19-1002	BC-563	4606		2.2 Microhenries
L12	1st FM IF	ZZ-630-114	16-3487				
L13	Fil. Choke	L-520-156	19-1000	BC-561	4602		1.25 Microhenries
L14	2nd FM IF	ZZ-509-130	16-3487	FM-254	1463		
L15	3rd FM IF	ZZ-509-130	16-3487	FM-254	1463		
L16	Fil. Choke	L-520-156	19-1000	BC-561	4602		1.25 Microhenries
L17	FM Limiter Ass'y	L-551-121					
L18	Ratio Det. Ass'y	ZZ-592-170					
L19	RF Choke	L-3352	19-1002	BC-563	4606		2.2 Microhenries; IRC Part #CLA

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA FISHER PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M1	1N295		1N60	1N295	Limiter Rect. (Pigtail)
M2	1N295		1N60	1N295	Limiter Rect. (Pigtail)
M3	1N541		1N67	1N295	Ratio Det. (Pigtail) Note 1
M4	1N541		1N67	1N295	Ratio Det. (Pigtail) Note 1

Note 1. Some versions may use 1N542 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	FISHER PART No.	NOTES
M5	Lamp	J-520-137	6 Volt, 2 Watt
M6	Lamp	J-520-137	6 Volt, 2 Watt
M7	Tuning Cap.	C-551-119	FM, 3 Gang
M8	Meter	M-551-134	Signal Strength
M9	Meter	M-551-169	Tuning, Channel Center

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	E-50049-5	Tuning
Knob	E-50049-3	On-Off, Muting
Panel	AS-630-104	Includes Escutcheon
Panel	AS-630-109	Less Escutcheon
Dial Pointer	A-551-125	
Dial Glass	N-551-117	
Meter Glass	N-551-193	Signal Strength
Meter Glass	N-551-194	Center Channel Tuning

WIRING DATA

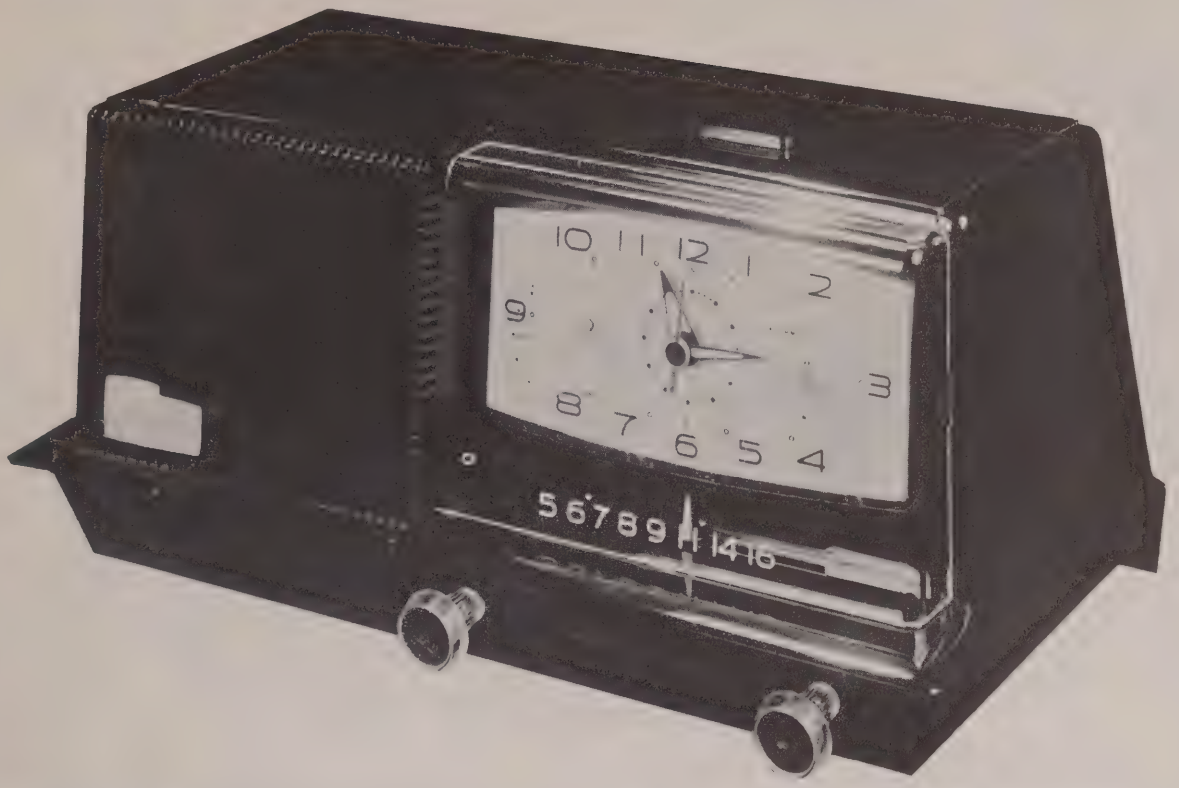
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

GENERAL ELECTRIC
MODELS C420A, C421

GENERAL ELECTRIC
MODELS C420A, C421



GENERAL ELECTRIC
MODELS C420A, C421

TRADE NAME	General Electric Models C420A, C421
MANUFACTURER	General Electric Co., Products Service, Radio Receiver Dept., 869 Broad St., Utica, N.Y.
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Six)	Types 12BA6 RF Amplifier, 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 35C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles — RATING .29 Amp. @ 117 Volts AC (27 Watts)
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05mfd	High side to pin 7 (grid) of 12BE6 (V2). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001mfd to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	Tune to 1500KC signal	"	A6, A7	"
4.		"	600KC	Tune to 600KC signal	"	A8	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 2, 3 and 4.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of H531

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12BA6	
V4	Det.-AVC-AF Amp.	12AV6	
V5	Output	35C5	
V6	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	General Electric PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	100	150	RS-1134	PRS150V8040 20	BBRD0183.7	TCT3117	TDLD-14	FMT-1550	RI507 *
B	50	150							

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	1.8		RS-1191						
C3	47		RCW-3075						N220
C4	.05	400		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C5	150		RS-1204	BPD-00015	DD-151	L10T15	UC-5315	5GA-T15	
C6	220		RS-1203	BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C7	.02	400		P488N-02	DD-203	CUB4S2	GEM-412	4TM-S2	
C8	220		RS-1203	BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C9	.02	400		P488N-02	DD-203	CUB4S2	GEM-412	4TM-S2	
C10	6800		RS-1202	BPD-0068	DD-682	BYA10D68		5HK-D68	
C11	.047	200		P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C12	.047	200		P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C13	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C14	.05	400		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	General Electric PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	4meg	½	RS-1219					Volume, Tap @ 2.5meg
B	Switch							Radio-Phono

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

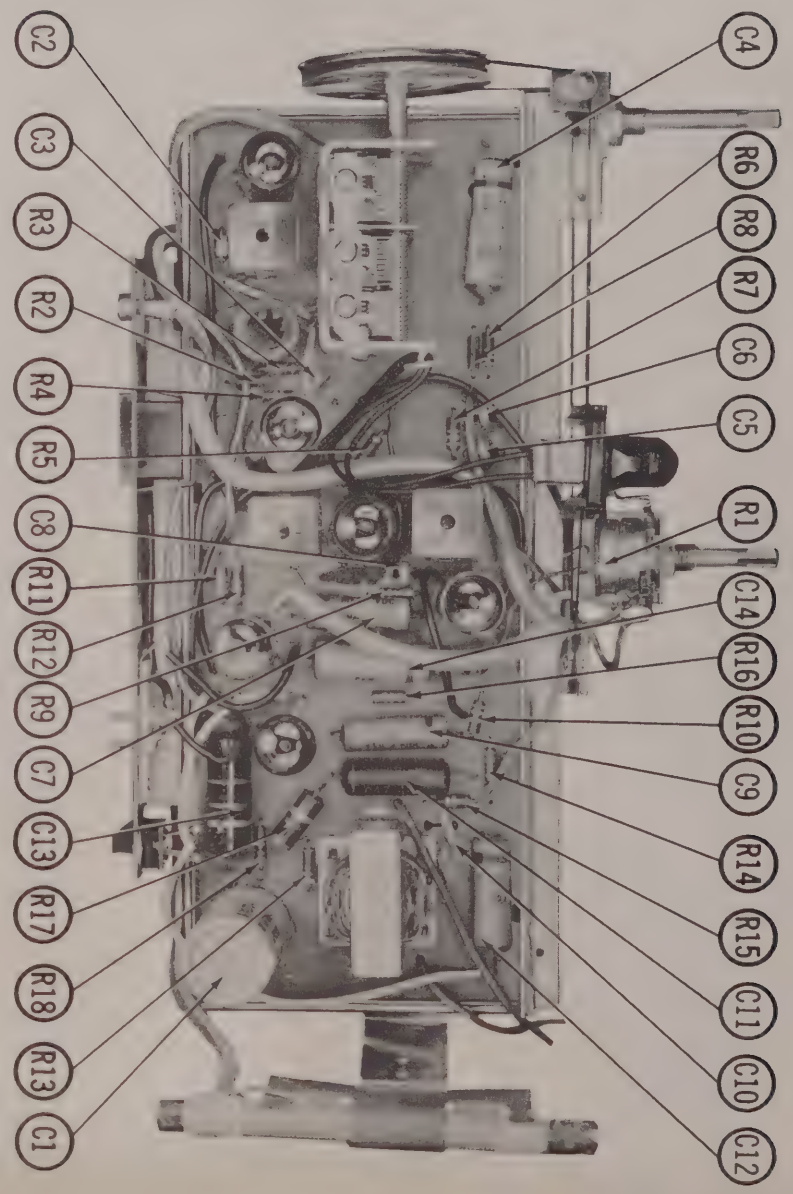
ITEM No.	RATING		General Electric PART No.	NOTES
	OHMS	WATT		
R2	22Ω			
R3	22K			
R4	100Ω			
R5	120Ω			
R6	2.2meg			
R7	33K			
R8	330K			
R9	6.8meg			
R10	470K			

ITEM No.	RATING		General Electric PART No.	NOTES
	OHMS	WATT		
R11	470K			
R12	150Ω			
R13	4700Ω			
R14	820Ω			
R15	15K			
R16	1800Ω			
R17	1000Ω	2		
R18	18Ω			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.1	General Electric PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω Tapped	3-4Ω	RS-1222 (113A6252)							

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	General Electric PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	RB-1046 (671C232-1)		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		General Electric PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loop Stick	RS-1220					
L2	RF Trans.	RS-1145					
L3	Osc. Coil	RS-1142					
L4	Input IF	RS-1143	16-6780	BC-356	13-PC9	RF-4	
L5	Output IF	RS-1143	16-6780	BC-357	13-PC10	RF-4	

MISCELLANEOUS

ITEM No.	PART NAME	General Electric PART No.	NOTES
M1	Lamp	RS-1323	#12
M2	Tuning Cap.	RS-1218	3 Gang (Ant. 30-390mmf)
M3	Switch	RS-1221	Tone, Slide Type
	Printed Board	204E116-17	

CABINETS & CABINET PARTS

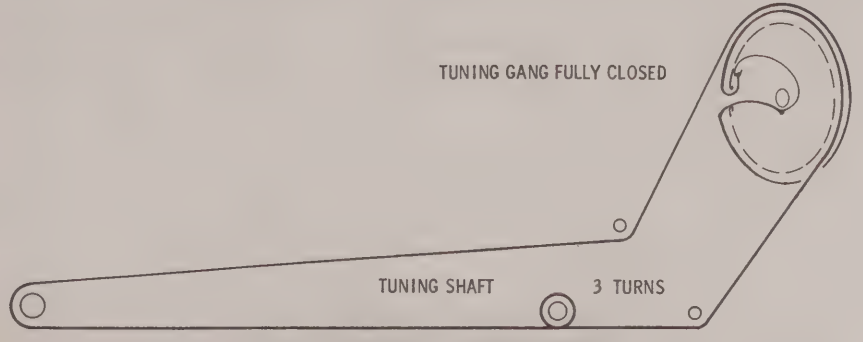
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	RS-1207	Snooz-Alarm Bar, Blue, Model C421
Knob	RS-1208	Snooz-Alarm Bar, Mahogany, Model C420A
Knob	RDK-425	Tuning & Volume
Cabinet Top	RB-1037	Mahogany, Model C420A
Cabinet Bottom	RB-1039	Mahogany, Model C420A
Cabinet Top	RB-1038	Blue, Model C421
Cabinet Bottom	RB-1040	Blue, Model C421
Cabinet Back	RB-1041	Mahogany, Model C420A
Cabinet Back	RB-1042	Blue, Model C421
Window	RS-1205	Dial Backing, Model C420A
Window	RS-1206	Dial Backing, Model C421
Clock Crystal	RS-1209	
Dial Pointer	RS-1210	

WIRING DATA

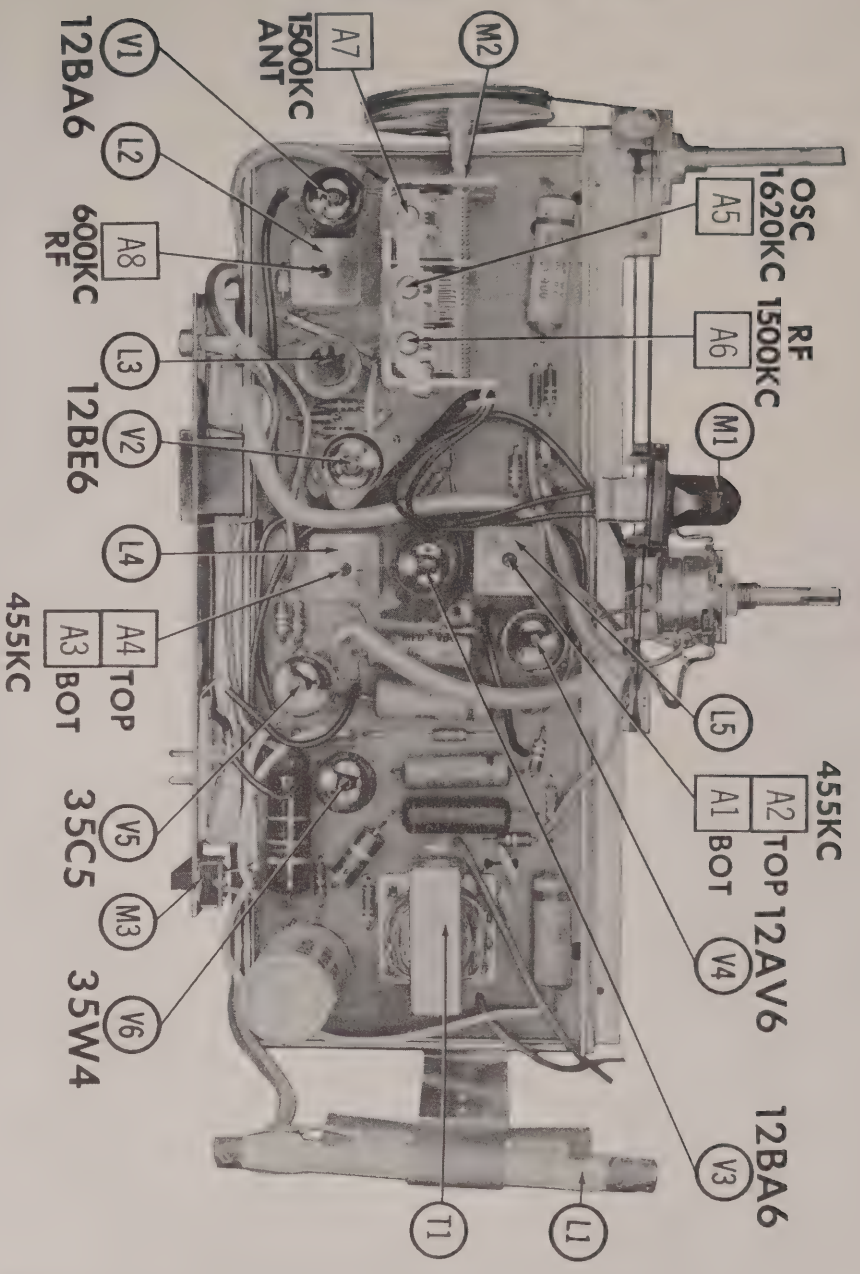
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

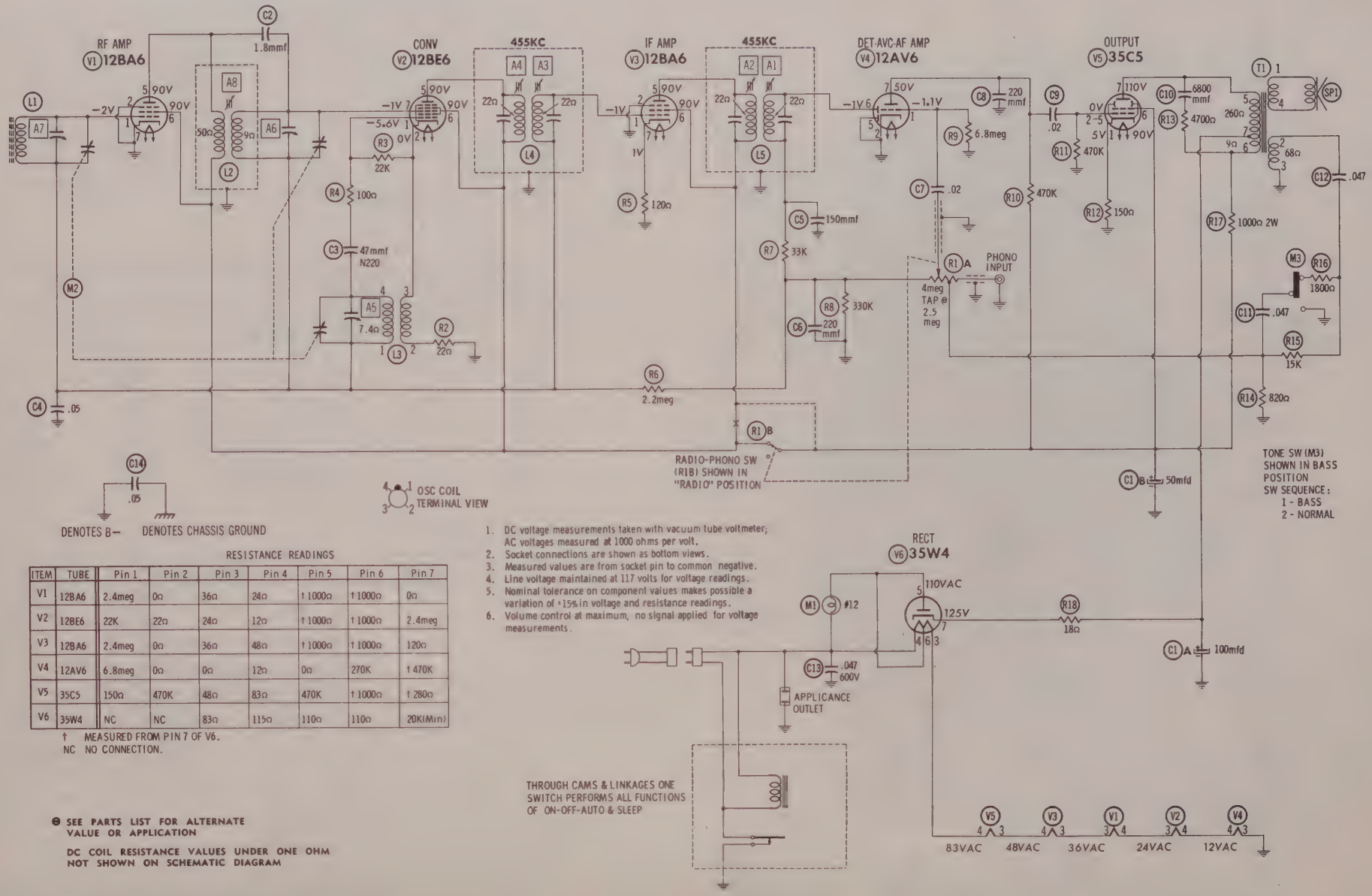


DIAL CORD STRINGING

CHASSIS—TOP VIEW



GENERAL ELECTRIC MODEL C420A



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	2.4meg	0Ω	36Ω	24Ω	† 1000Ω	† 1000Ω	0Ω
V2	12BE6	22K	22Ω	24Ω	12Ω	† 1000Ω	† 1000Ω	2.4meg
V3	12BA6	2.4meg	0Ω	36Ω	48Ω	† 1000Ω	† 1000Ω	120Ω
V4	12AV6	6.8meg	0Ω	0Ω	12Ω	0Ω	270K	† 470K
V5	35C5	150Ω	470K	48Ω	83Ω	470K	† 1000Ω	† 280Ω
V6	35W4	NC	NC	83Ω	115Ω	110Ω	110Ω	20K(Min)

† MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

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EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

GRUNDIG MAJESTIC MODELS TK5, TK8, TK8/3D, TK8E, TM8, TM8E, TM8U

GRUNDIG MAJESTIC MODELS TK5, TK8, TK8/3D, TK8E, TM8, TM8E, TM8U

GRUNDIG MAJESTIC MODELS TK5, TK8, TK8/3D, TK8E, TM8, TM8E, TM8U

GENERAL INFORMATION

The Grundig Majestic Models TM8, TM8E, TM8U, TK8/3D, TK8E, TK8 and TK5 are similar mechanically. The major differences among the models are in the amplifiers. Notice these differences in the schematics and the electrical parts list found at the back of the manual.

These tape recorders record and playback two tracks of material on standard-width recording tape. Two different tape speeds can be selected by means of a switch. The frequency response, using 7 1/2 ips, is 40 to 16,000 cps; using 3 3/4 ips, 50 to 10,000 cps.

Models TM8, TM8E, and TM8U tape recorders can be used on AC power supplies having the following voltage ratings: 117, 150, 200, 220, 240, and 50/60 cps. Models TK8, TK8/3D, and TK8E operate from 60 cycle, 110 and 220 volts only. Model TK5 operates from 50 cycle, 110, 125, 145, 165, and 220 volts only. Make sure that tape recorders are adjusted to match voltage and line frequency of power supply.

Supplied by:

Majestic International Sales Corporation

743 West La Salle Street

Chicago 10, Illinois

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS, INDIANA

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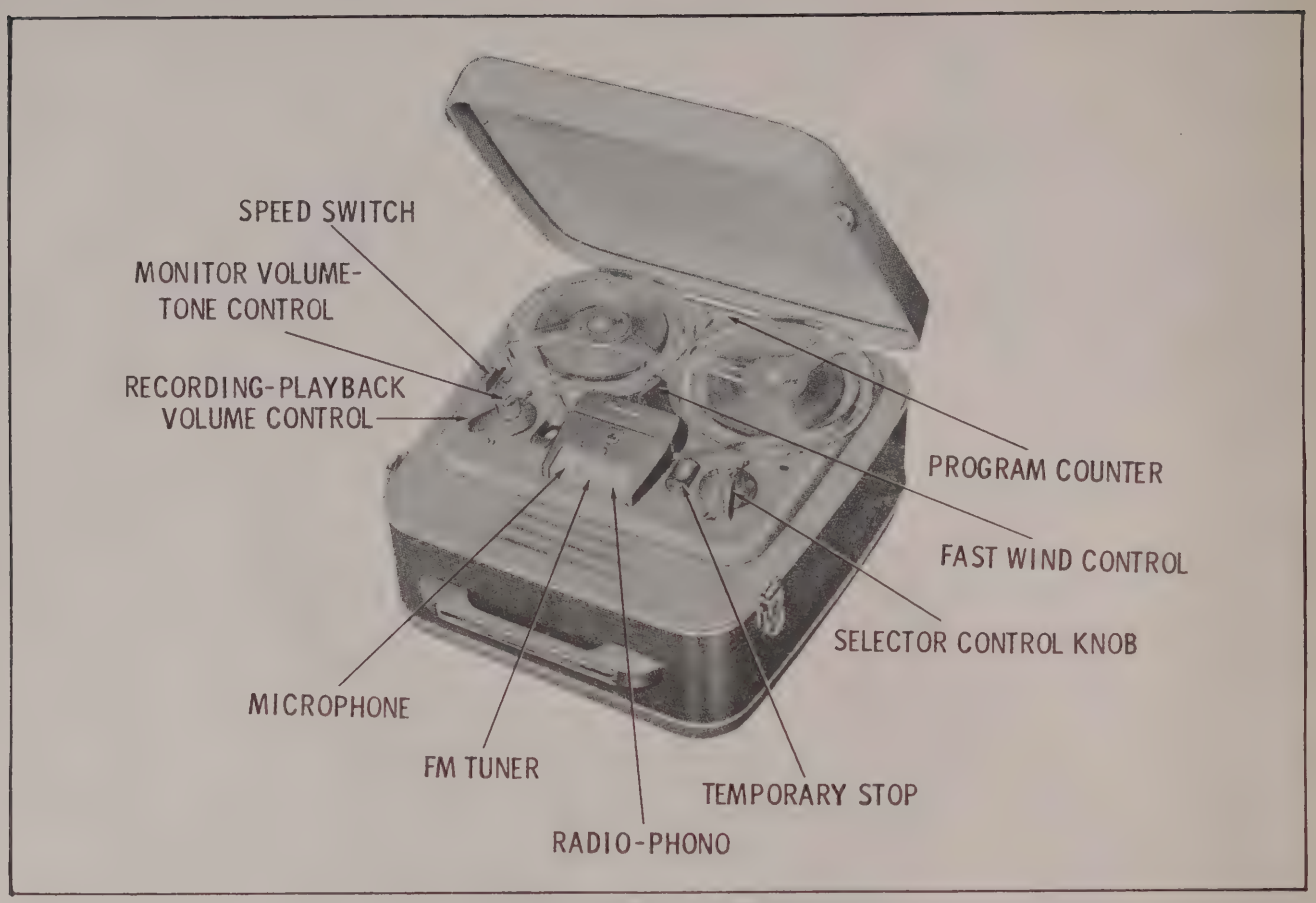


FIG. 1 CONTROL FUNCTIONS

SPECIFICATIONS

Models TK8, TK8/3D and TK8E

Tape Speeds:
3 3/4 and 7 1/2 ips, dual track

Frequency Response:
7 1/2 ips; 40-16,000 cps, 3 db
3 3/4 ips; 50-10,000 cps, 3 db

Signal-to-Noise Ratio:
55 db (at "0" signal; 600 millivolts, 1,000 cps)

Flutter and Wow:
7 1/2 ips; less than 0.1%
3 3/4 ips; less than 0.2%

Reel Size:
7"

Fast Wind Ratio:
30.1

Power Output:
6 watts undistorted

Harmonic Distortion:
Less than 1%

Bias Frequency:
60 kc

Bias Current:
1 milliampere

Erase Current:
50 milliamperes

Head Gap Width:
.0002369" (constant from surface to core for a distance of 40 mils)

Inputs:
3 high-impedance

Outputs:
1 high-impedance; 1 low-impedance

Speakers:
3 wide-range PM speakers

Power Rating:
75 watts, 60 cycle, 110-120 volts AC

Voltages:
60 cycle, 110 and 220 volts AC only

Tubes:
EF86, ECC81, EL42, EL84, EM85 and selenium rectifiers

Motor:
Outer rotating cage, split-phase induction

Record Level Indicator:
Magic eye

Program Indicator:
Tape Counter with zero adjust

Fast Forward and Rewind Time:
Approximately 100 seconds

Automatic Stop Switch:
Electromagnetic

Current:
AC, 60 cps

Models TM8, TM8E and TM8U

Tape Speeds:
3 3/4 and 7 1/2 ips, dual track

Frequency Response:
3 3/4 ips; 50 to 10,000 cps
7 1/2 ips; 40 to 16,000 cps

Flutter and Wow:
Less than 0.3%

Reel Size:
7"

Fast Wind Ratio:
30:1

Magnetization:
High frequency approximately 40 kc

Inputs:
3 high-impedance

Power Rating:
Approximately 50 watts (rising to 90 watts when fast winding).

Voltages:
60-50 cps convertible. Suitable for AC only. 117, 150, 200, 220, and 240 volts.

Tubes:
EF86, ECC81, EL42, EM85, and 2 selenium rectifiers.

Motor:
Outer rotating cage, split-phase induction

Record Level Indicator:
Magic eye

Program Indicator:
Tape counter with zero adjust

Fast Forward and Rewind Time:
Approximately 100 seconds

Automatic Stop Switch
Electromagnetic

Current:
AC, 60-50 cps

Model TK5

Tape Speed :
3 3/4 ips

Frequency Response:
50 to 10,000 cps

Flutter and Wow:
Not more than 0.5%

Reel Size:
7"

Fast Wind Ratio:
30:1

Power Output:
6 watts undistorted

Harmonic Distortion:
Less than 1%

Bias Frequency:
60 kc

Inputs:
3 high-impedance

Outputs:
1 high-impedance; 1 low-impedance

Speakers:
One wide-range PM speaker

Power Rating:
Amplifier, 27 watts
Recording and playback, 55 watts
Fast wind and fast forward, 95 watts

Voltages:
50 cycle, 110, 125, 145, 165, 220V

Tubes:
EF86, EL42, ECC81, EM85, EL42, and selenium rectifiers

Motor:
Outer rotating cage, split-phase induction

Record Level Indicator:
Magic eye

Program Indicator:
Tape Counter with zero adjust

Fast Forward and Rewind Time:
Approximately 100 seconds

Automatic Stop Switch:
Electromagnetic

Frequency Range:
50 to 10,000 cps

Current:
AC, 50 cps

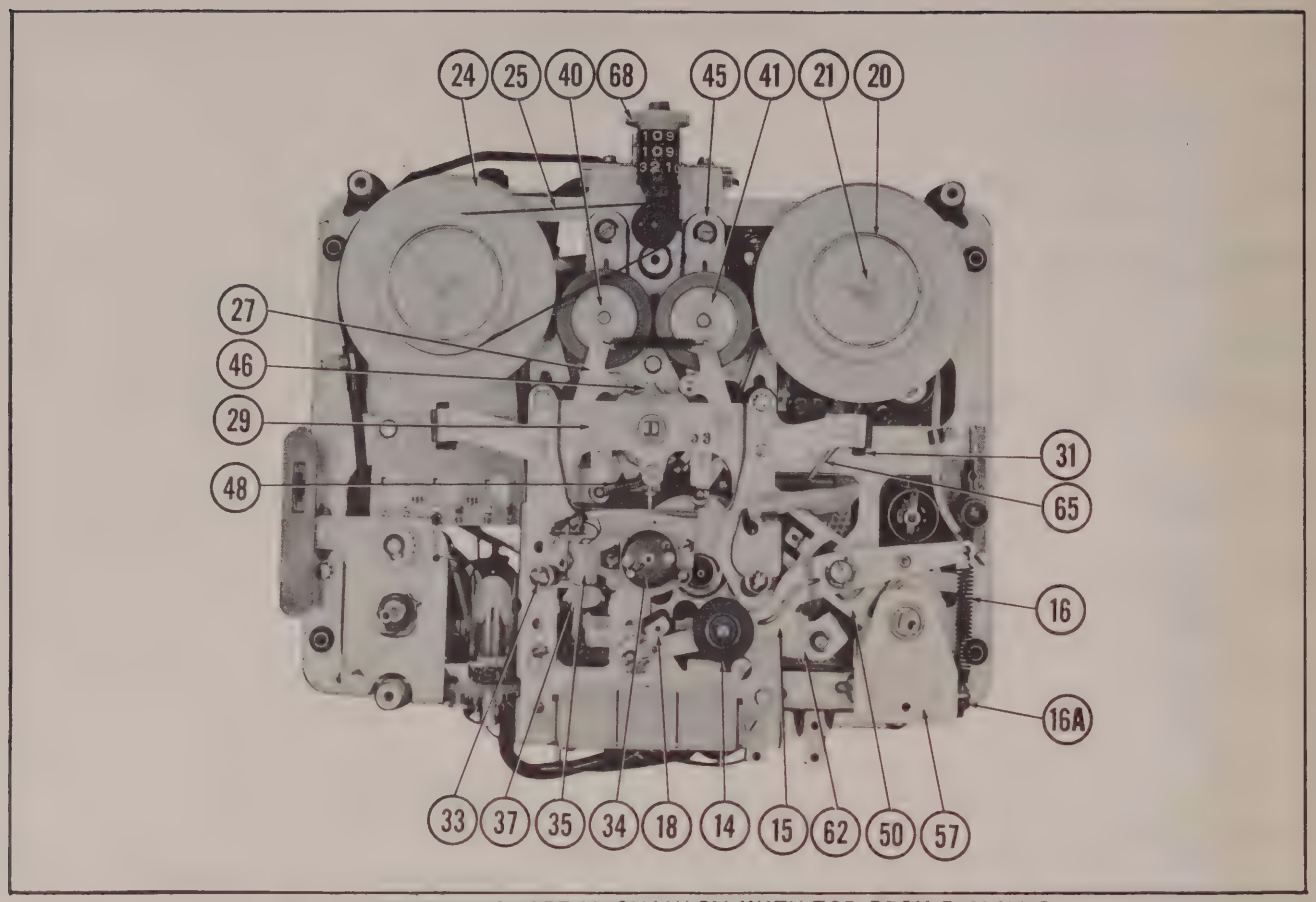


FIG. 2 TAPE TRANSPORT MECHANISM WITH TOP DECK REMOVED

CONTROLS

Record-Playback Volume Control (9)

When recording sound, this control determines the quality of the recording; when playing back, it controls the volume.

Selector Control Knob (3)

This control selects any of these functions:

1. With Selector control (3) in the "OFF" position, motor is switched off.

Note: Always turn to this position before switching off the unit or threading a new tape.

2. With Selector control (3) in the "REW" position, Fast Wind control (5) can be used. (See "Fast Wind Control" immediately following.)

3. With Selector control (3) in the "REC" position, recordings can be made.

To put Selector control (3) in this position, lift it slightly. This is a safety measure and prevents unintentional erasing of recordings.

4. With Selector control (3) in the "PB" position, playback is obtained.

Fast Wind Control (5)

This control enables tape to rapidly move forward or backward. It functions only with Selector control (3) in "REW" position. With control pointing left, fast rewind is obtained. With the control pointing right, the tape moves in a fast forward direction. Between the two positions and the center (neutral) position, a braking action is supplied. When switching for either Fast Wind position to neutral, the control must be operated slowly. Keep switch in brake position until tape run has stopped completely.

Monitor Volume—Tone Control (7)

This control is found on Models TK8, TK8/3D, TK8E and TK5 only.
It acts as a volume control for the internal loudspeakers when these units are recording and as a tone control when they are playing back. This control also is the On-Off switch for the units. When pulled out, it also cuts out the internal loudspeakers.

On-Off Control (7)

This control is found on Models TM8, TM8E, and TM8U only.

Temporary Stop (4)

Pulling the temporary stop (4) forward stops the recorder from recording or playing back until it is released.

Program Counter (68)

This counter helps the operator locate the beginning of any recording. When putting on a new tape, place the counter on zero by turning the knurled disc.

Speed Switch (10)

Set this switch before starting to record. Never switch speeds during fast rewind. This switch is not found on Model TK5

Input Selector Buttons

These three buttons select any one of the following three types of inputs:

1. Microphone
2. Radio
3. Tuner

OPERATING INSTRUCTIONS

Threading the Tape

1. Selector control (3) should be switched to "OFF" position.

2. Hold the full reel so loose end of tape hangs down left side of reel. Place reel on left-hand spindle (20). Turn it slightly until it falls into place and is held securely by the ridges on the spindle. Place the empty reel onto the right-hand spindle in the same manner.

3. Unwind about 10" of tape from the reel. Hold a section of tape taut with both hands and insert into tape slot. Make sure the dull-coated side faces rear of recorder.

4. Insert free end of tape into empty reel slot. Turn reel several turns counterclockwise until tape is secured to reel and slack is taken up.

Switching on Machine

To switch on, turn small left-hand control (7) to right until it clicks. After a few seconds to allow the tubes to warm up, the unit is ready to record or playback.

To Record from Microphone

1. Insert microphone plug into "Microphone" input at rear of unit.

2. Depress "Microphone" push button.

3. Now pull temporary stop (4) forward and lock the switch. Set Selector Control knob (3) to "REC" position by pulling it out slightly to overcome the safety feature that prevents accidental erasure.

4. With temporary stop (4) still locked, adjust Record-Playback Volume control (9) until the two sections of green light in the magic eye start to move while you are talking. Keep talking and turning the control until the green light sections flutter freely without overlap.

Note: Do not place the microphone near the unit, as background noises will be recorded. It is best to have the microphone as far away as possible from the recorder.

5. Release temporary stop (4). The tape will move from the left-hand to the right-hand reel. From this instant, every sound picked up by the microphone will be recorded on the tape.

To Play a Recording

1. Thread tape as described under "Threading the Tape."

2. Turn On-Off control to On. Allow thirty seconds for tubes to warm up.

3. Turn Selector control knob (3) to "PB" position.

4. Adjust volume and tone controls.

Recording from Radio or TV

In Models TM8, TM8E, and TM8U, recordings can be made from the detector output of an FM-AM tuner, radio or TV receiver by:

1. Depressing Radio button.

2. Proceeding as described under "To Record from Microphone".

In Models TK8, TK8/3D, TK8E and TK5, recordings must be made from an external radio or TV. Recordings can be made from a radio or TV by placing the microphone near the loudspeaker. This may not be satisfactory, however, as other sounds may be picked up and recorded. A recording of superior quality can be made by using a patch cord. Connect the patch cord as follows:

1. Connect the cord clips across the voice-coil terminals on the radio or TV speaker.

2. Insert the cord plug into the Radio input at rear of recorder.

3. Proceed as described under "To Record from Microphone".

To Record from Phonograph

1. To record from magnetic cartridge:
   (a) Feed output to phono preamplifier.
   (b) Connect preamplifier output to FM Tuner jack at rear of recorder. Depress FM Tuner button and proceed as described under "To Record from Microphone".

2. To record from crystal or ceramic cartridge:
   (a) Connect leads from pickup arms to Radio jack at rear of recorder. Ground connection of pickup must be connected to the lead shield.
   (b) Depress Radio button.
   (c) Proceed as described in "To Record from Microphone".

To Edit and Splice Tape

Note: Since it is impossible to edit and splice one track without affecting the other, recordings to be edited should be limited to one track only.

1. Tape may be edited by cutting out unwanted portions or by joining selections into another sequence.

Announcements, etc., may be inserted between selections. Unused portions of tape can be spliced for re-use.

(a) Cut tape at 60° angle with an overlap so ends will line up. (By cutting at 60° angle, the splice cannot be detected).
(b) Align both ends of tape, with glossy side up.
(c) Cover aligned ends evenly and securely with splicing tape.
(d) Trim off excess splicing tape. (Cut into the recording tape very slightly.) This eliminates a possible sticky splice.

Program Counter (58)

The program counter registers from "000" to "999" and saves much guesswork when trying to locate a desired portion of a prerecorded tape. The indicator reading may be noted while the recording is being made so that reference to any given point of the tape may be rapidly made. When a recorded tape has been logged in this manner, always zero the indicator before starting to play recording. Do this before tape is threaded on take-up reel. Turn the Fast Wind control to the forward position and observe the indicator. Turn Fast Wind control to neutral position when approaching the logged numbers. Then, the last few digits can be turned off manually by spinning the take-up reel.

MECHANICAL ADJUSTMENTS

Brake Lever Adjustment

Adjust leather stops (31) of both brake levers (27 and 28) to a length of about 1/16". During braking action, leather stops (31) press against clutches (24).

Adjusting Clutches

Make sure both upper clutch halves (24) level with each other. Assembled clutches must have a distance of approximately 1/64" from lower to upper parts. The tape should run in the center of the tape reel. (Maximum distance from top edge of clutches (24) to edge of base assembly of the heads should be 1/32".)

Tape Guide Adjustment

The tape must be guided in a straight line along its full travel; therefore, correct alignment of the tape guides is critical. Both the pressure roller and drive capstan must be absolutely vertical and parallel to each other. Pressure of the pressure roller against the tape should be 2 1/2 lbs., corresponding to a pull of about 12 oz. to 1 lb. on the tape. This can be adjusted by means of tension nuts (16A). Pressure of pressure bracket (18), with felt ring against record-playback head, should be approximately 2 oz. The felt pad must be adjusted correctly to the gap of the record-playback head and must be fitted absolutely vertical to the head surface.

ELECTRICAL ADJUSTMENTS

Head Alignment

Record-playback head (34) adjustments should be carried out by means of an adjustment tape.

1. Vertical adjustment of the gap is made by using the 6,000-cps section of the tape. Align head to maximum output (with VTVM connected to recorder amplifier output).

2. With 1,000-cps section of alignment tape, check lower track for track overlap. The lower track must be inaudible. If lower track is audible, readjust head.

3. Erase head gap edge should line up with top edge of tape.

4. In the playback position, there should be a 3/64" space between tape and erasing head.

MAINTENANCE

After several hundred hours, sounds that should have been completely erased when a new recording is made are still present as a faint "ghost" and reproduction of the higher frequencies tends to be weak. This is caused by microscopic particles of tape sticking to the magnetic heads. Clean the front of the heads, the capstan, and pressure roller with a cloth and alcohol.

Caution: Do not clean the heads with a brush or any metallic object; this could mar the head surfaces.

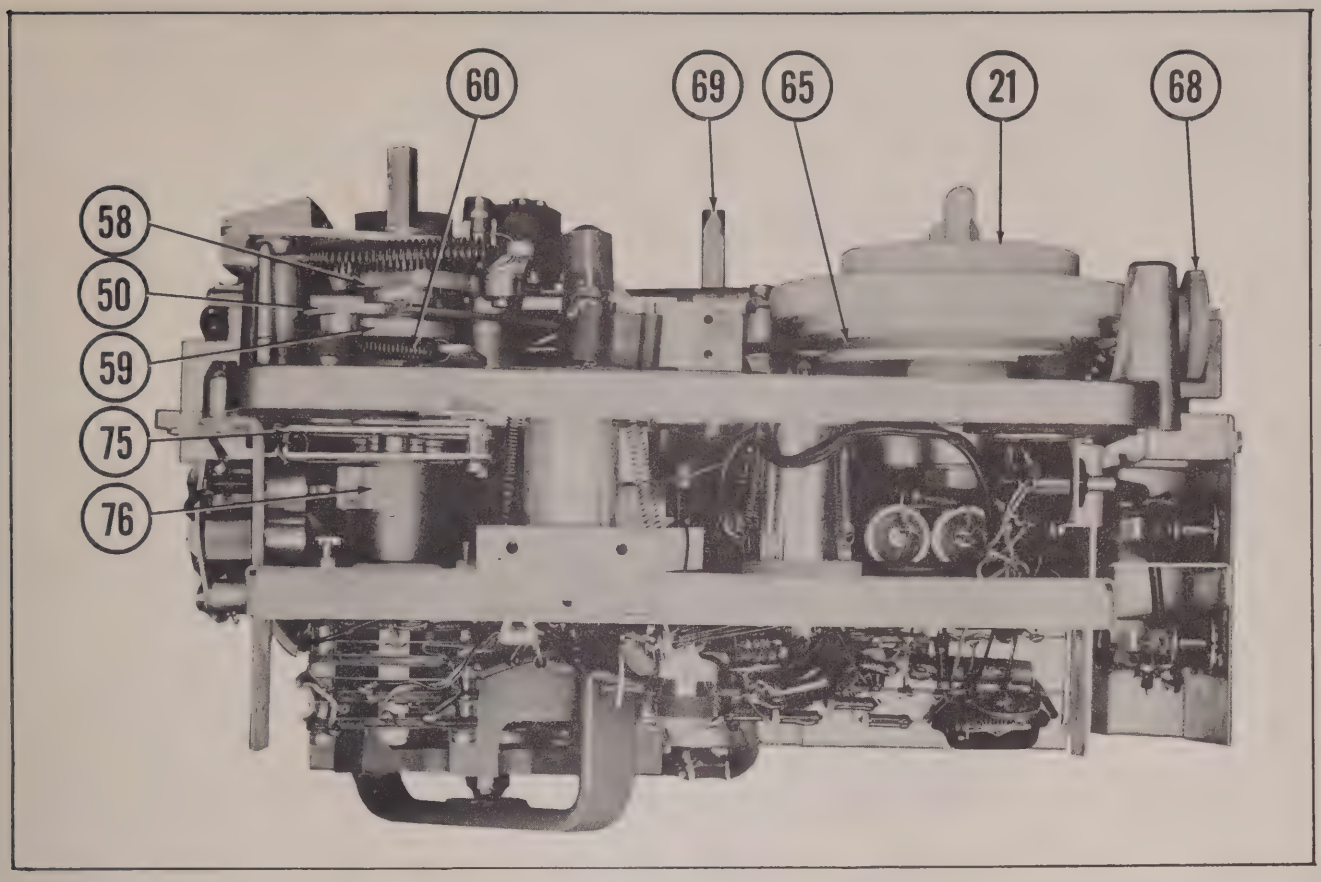


FIG. 3 TAPE TRANSPORT MECHANISM SIDE VIEW

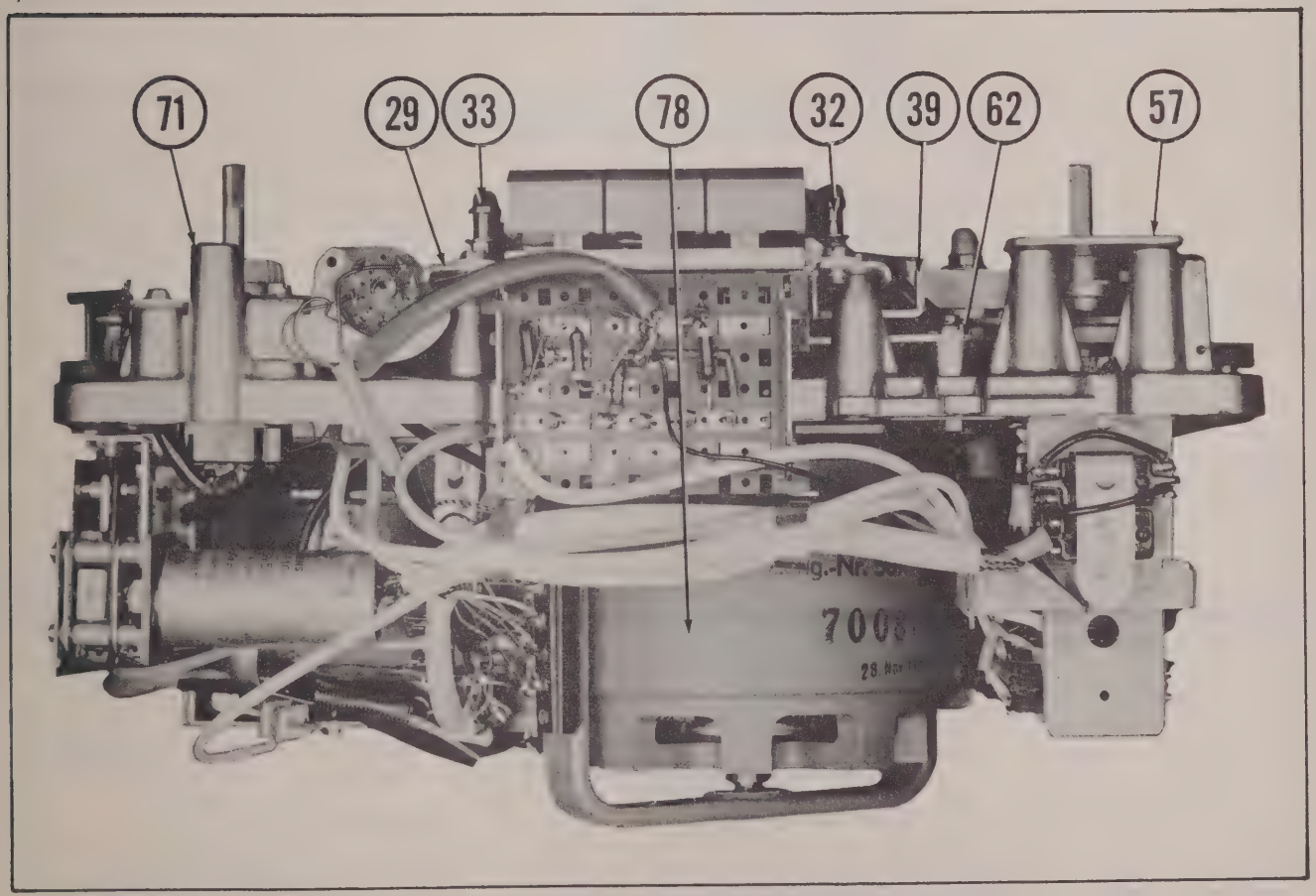


FIG. 4 TAPE TRANSPORT MECHANISM FRONT VIEW

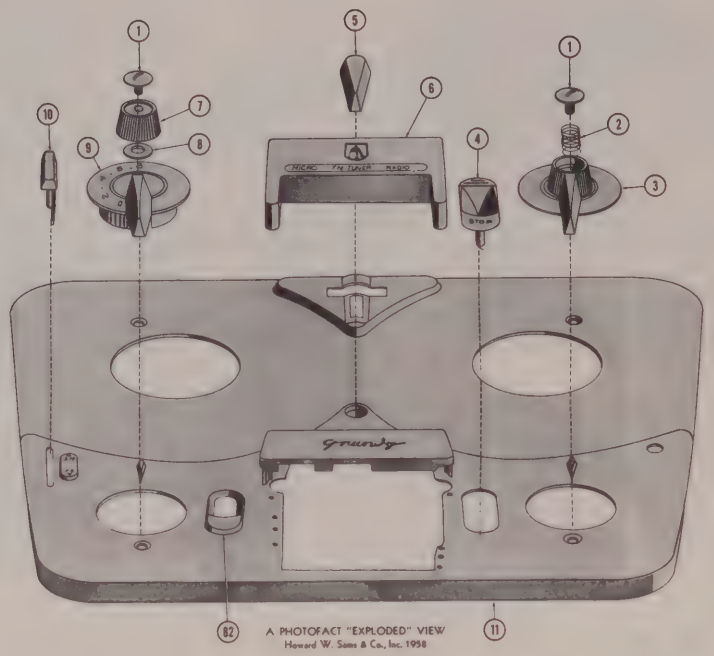


FIG. 5A. EXPLODED VIEW OF PARTS ABOVE TOP PLATE

TROUBLE CHART

Symptom	Cause	Remedy
Motor fails to start.	1. Motor starting capacitor defective.	1. Replace.
	2. Motor defective.	2. Replace.
	3. Fuse defective.	3. Replace.
Two-speed switch does not operate.	1. Defective two-speed switch.	1. Replace.
	2. Two-speed switch contacts not making contact.	2. Bend contacts to original shape.
Left-hand spindle does not revolve in "REW" position.	1. Left-hand brake lever (27) not releasing properly.	1. Free brake lever (27). Also check adjustment of leather stops (31).
	2. Drive belt (64) off pulleys.	2. Align pulleys.
	3. Left-hand fast wind roller (40) not contacting left-hand spindle.	3. Spring (48) broken or missing; replace.
	4. Drive belt (64) broken.	4. Replace.
Right-hand spindle does not revolve in "REW" position.	1. Right-hand brake lever (28) not releasing properly.	1. Free brake lever (28). Also check adjustment of leather stops (31).

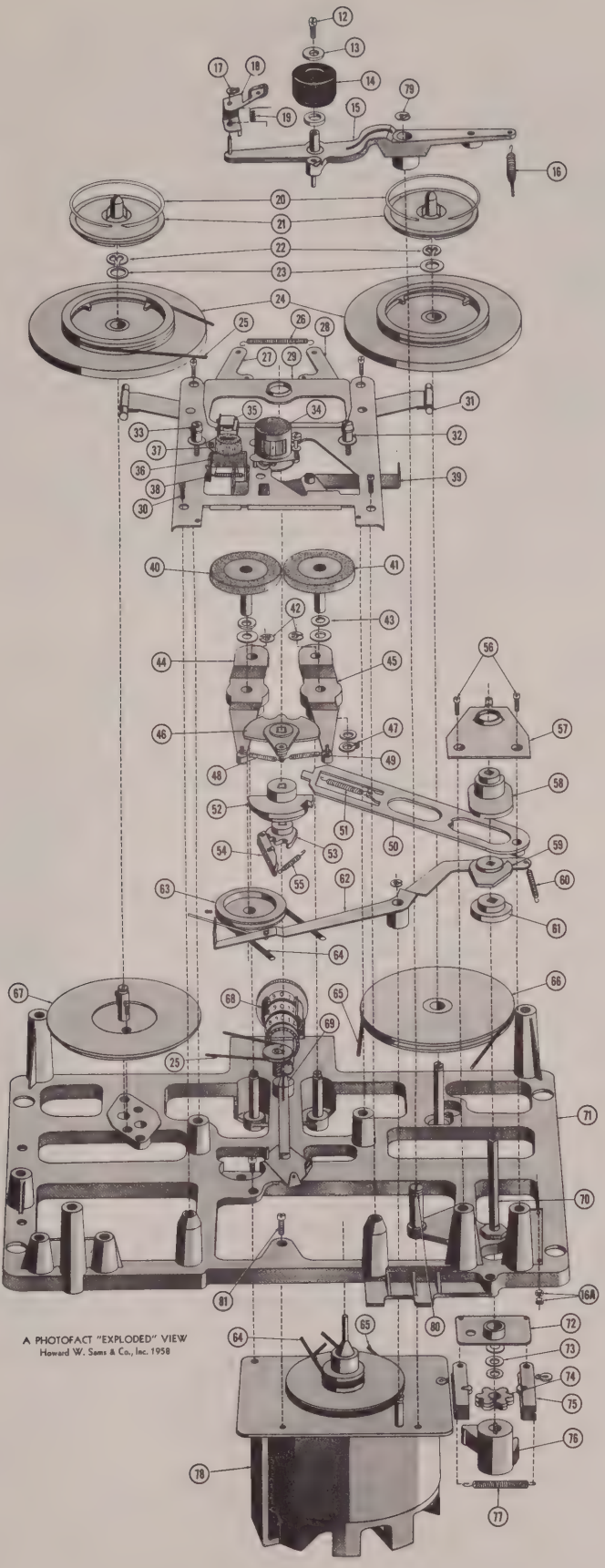


FIG. 5B EXPLODED VIEW OF PARTS BELOW TOP PLATE

TROUBLE CHART (CON'T)

Symptom	Cause	Remedy
	2. Drive belt (64) off pulleys.	2. Align pulleys.
	3. Right-hand fast wind roller (41) not contacting right-hand spindle.	3. Spring (49) broken or missing; replace.
Right-hand spindle does not revolve in "REC" or "PB" positions.	1. Right-hand spindle drive belt (65) broken or off pulley.	1. If belt is broken, replace. If belt is off the pulley, put it back on. Realign pulleys.
Brakes do not brake spindle.	1. Brake levers (27 and 28) fail to contact spindles.	1. Spring (26) missing or broken; replace.
	2. Brake leather stops (31) worn.	2. Readjust for proper contact.
Wow while recorder operates.	1. Check all driving surfaces for oil or foreign matter.	1. Clean with a cloth and alcohol.
	2. Clutches slipping.	2. See "Adjusting Clutches" under "Mechanical Adjustments".
Flutter while recorder operates.	1. Dirty play-record head (34), pressure pads, capstan shaft or pressure roller (14).	1. Clean as described under "Maintenance".
No erase; incomplete erase.	1. Erase head (35) not adjusted properly.	1. See "Head Alignment".
	2. Erase head circuit defective.	2. Check circuit components.
Motor and amplifier do not operate.	1. No current at motor or amplifier.	1. Check to see that: (a) Current is reaching AC leads. (b) Fuse is not burned out. If so, replace. (c) On-Off switch operates properly.
Weak output.	1. Record-playback head (34) not aligned properly.	1. Using alignment tape, align head for maximum output. See "Head Adjustment".
	2. Pressure pad (18A) not contacting head properly.	2. Pressure pad (18A) should completely contact head. Check spring (19) for proper tension; also check pad for wear. If pressure pad is worn, replace.
	3. Tape guides (32 and 33) not adjusted properly.	3. See "Tape Guide Adjustment".
	4. Defective record-playback head (34).	4. Replace.
Counter does not operate.	1. Counter belt (25) off pulleys.	1. Replace belt on pulleys.
	2. Gears binding.	2. Check gears and pulley for binding.
Does not shut off at end of tape.	1. Switching-off relay not operating properly.	1. (a) Defective relay; replace. (b) Voltage low; check circuit for cause.

MODELS TK8, TK8/3D, TK8E, PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Pre Amp.	EF86
V2	AF Amp.	12AT7/ ECC81
V3	Record Level Indicator	EM85

ITEM No.	USE	TYPE
V4	Bias Osc.	EL42
V5	Audio Output	6BQ5 / EL84

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Grundig Majestic PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	385		PRS45V40	BR4045	TC78	TD-40-450	MT-4540	TVA-1712
C2	100	80		PRS150V100	BR10015	TC493	TD-100-150	MT-15100	TVA-1420
C3	40	385		PRS450V40	BR4045	TC78	TD-40-450	MT-4540	TVA-1712
C4	16	385		PRS450V16	BR1645	TC74	TD-16-450	MT-4516	TVA-1708
C5	16	385		PRS450V16	BR1645	TC74	TD-16-450	MT-4516	TVA-1708
C6	16	385		PRS450V16	BR1645	TC74	TD-16-450	MT-4516	TVA-1708
C7	50	15		PRS25V50	BBR50-25	TC29	TD-50-25	MT-0250	TVA-1206
C8	10	15		PRS25V10	BBR10-25	TC22	TD-10-25	MMT-0210	TE-1155
C9	20	100NP			BR4015 † BR4015 †	TC48 † TC48 †	TD-40-150 † TD-40-150 †	MT-1540 † MT-1540 †	R2379 *

* Non-Catalog Item
† Connect Negative Leads

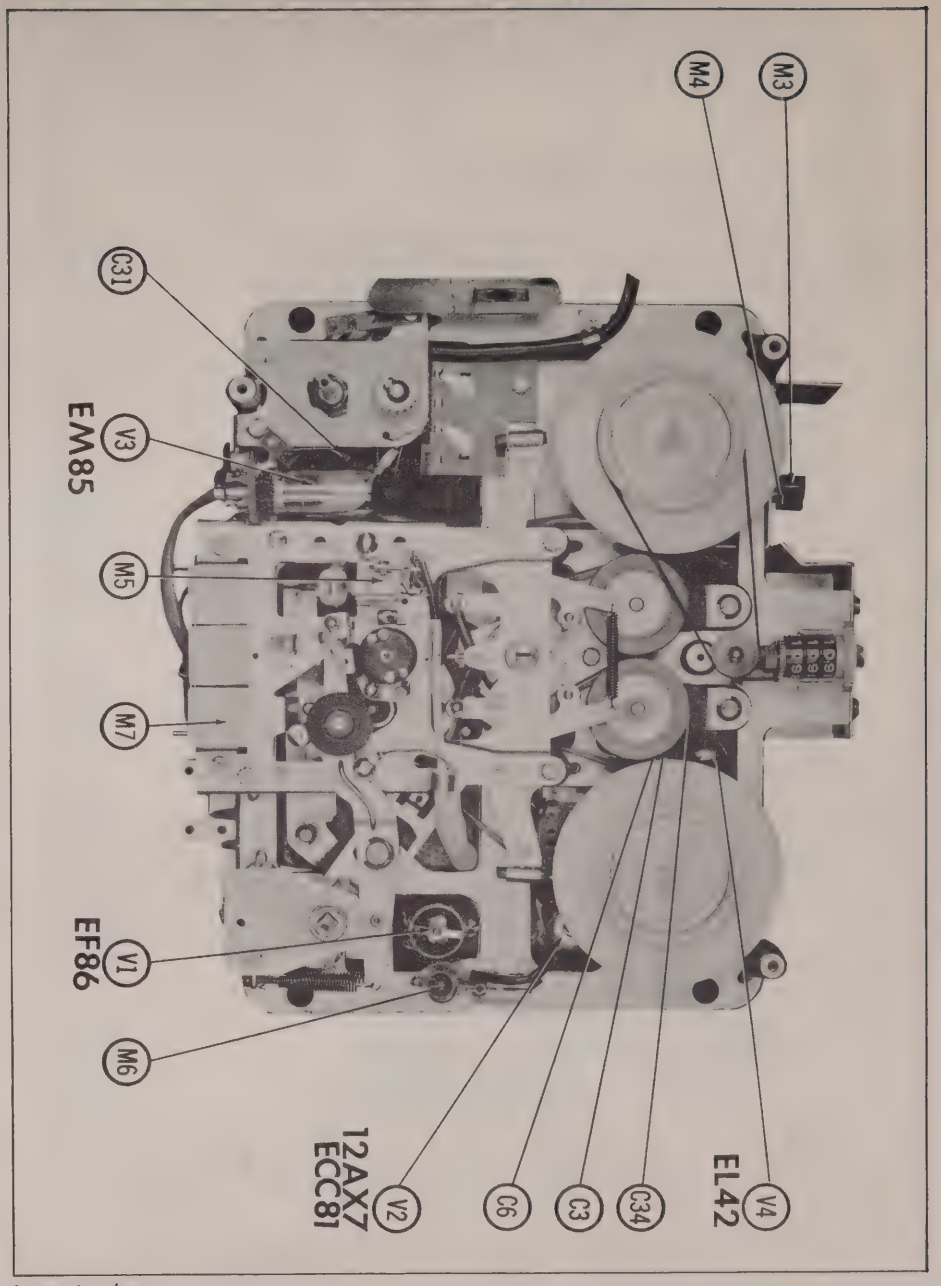
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Grundig Majestic PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C10	.01	250		P488N-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C11	.25	500		P488N-25		CUB6P25		GEM-6025	6TM-P25	
C12	.05	500		P688N-05	DF-503	CUB6S5		GEM-615	5TM-S5	
C13	.02	125		P288N-02	DD-203	CUB2S2	ED-02	GEM-412	2TM-S2	
C14	3000			1467-003	DD-302	1R5D3	CY20C302J	MC461	1FM-23	
C15	1300			1467-0013	DD-132	1R5D13	CY20C132J		1FM-213	
C16	1300			1467-0013	DD-132	1R5D13	CY20C132J		1FM-213	
C17	20			1468-00002	DD-200	22R5Q2	CY10C200K		1FM-42	
C18	300			1468-0003	DD-301	5R5T3	CY15C301J	MC241	1FM-33	
C19	400			1468-0004	DD-401	5R5T4		MC243	1FM-34	
C20	.025	500		P688N-025				GEM-6125		
C21	.1	500		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C22	.05	125		P288N-05	DF-503	CUB2S5		GEM-615	2TM-S5	
C23	.25	125		P288N-25		CUB2P25		GEM-2025	2TM-P25	
C24	120			1468-00012	DD-121	22R5T12	CY10C121K		1FM-312	
C25	2000			1467-002	DD-202	1R5D2	CY20C202K	MC457	1FM-22	
C26	2000			1467-002	DD-202	1R5D2	CY20C202K	MC457	1FM-22	
C27	60									
C28	60									
C29	.01	500		P688N-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C30	.005	125		P288N-005	D6-502	CUB6D5	GP-5000	GEM-425	6TM-D5	
C31	700					1R5T7			1FM-37	
C32	2000			1467-002	DD-202	1R5D2	CY20C202K	MC457	1FM-22	
C33	.001	500		P688N-001	D6-102	CUB6D1	GP-1000	GEM-421	6TM-D1	
C34	.25	500		P688N-25		CUB6P25		GEM-6025	6TM-D25	
C35	1.5	500								① 10%
C36A	3.5	500								
C36B	1.0	500						GEM-61	TC-10	② 10%

① Not used in some versions.
② When C35 is not used, C36B is used to replace it.

CHASSIS—TOP VIEW



MODELS TK8, TK8/3D, TK8E, PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Grundig Majestic PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½						Tone
B	Switch							Pull, Speaker Off
C	Switch							Turn On-Off
R2	500K	½	0628-016					Volume
R3	1meg	½	0629-017					Record Level Adj.
R4	100Ω	2(WW)						Hum Adj. Wire Wound

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Grundig Majestic PART No.	NOTES
	OHMS	WATT		
R5	200K			
R6	100K			
R7	20K			
R8	3K			
R9	1meg			
R10	10meg			
R11	200K			
R12	50K			
R13	1.25meg			
R14	1meg			
R15	200K			
R16	5000Ω			
R17	3000Ω			
R18	1000Ω			
R19	2meg			
R20	40K			
R21	40K			
R22	150K			
R23	100K			
R24	1meg			

ITEM No.	RATING		Grundig Majestic PART No.	NOTES
	OHMS	WATT		
R25	50K			
R26	5000Ω			
R27	1000Ω			
R28	100K			
R29	10K			
R30	200K			
R31	30K			
R32	20K			
R33	200K			
R34	1meg			
R35	25K			
R36	200K			
R37	1000Ω			
R38	100K			
R39	25K			
R40	100K	1		
R41	150Ω	1		
R42	2000Ω	1		
R43	1000Ω	3		

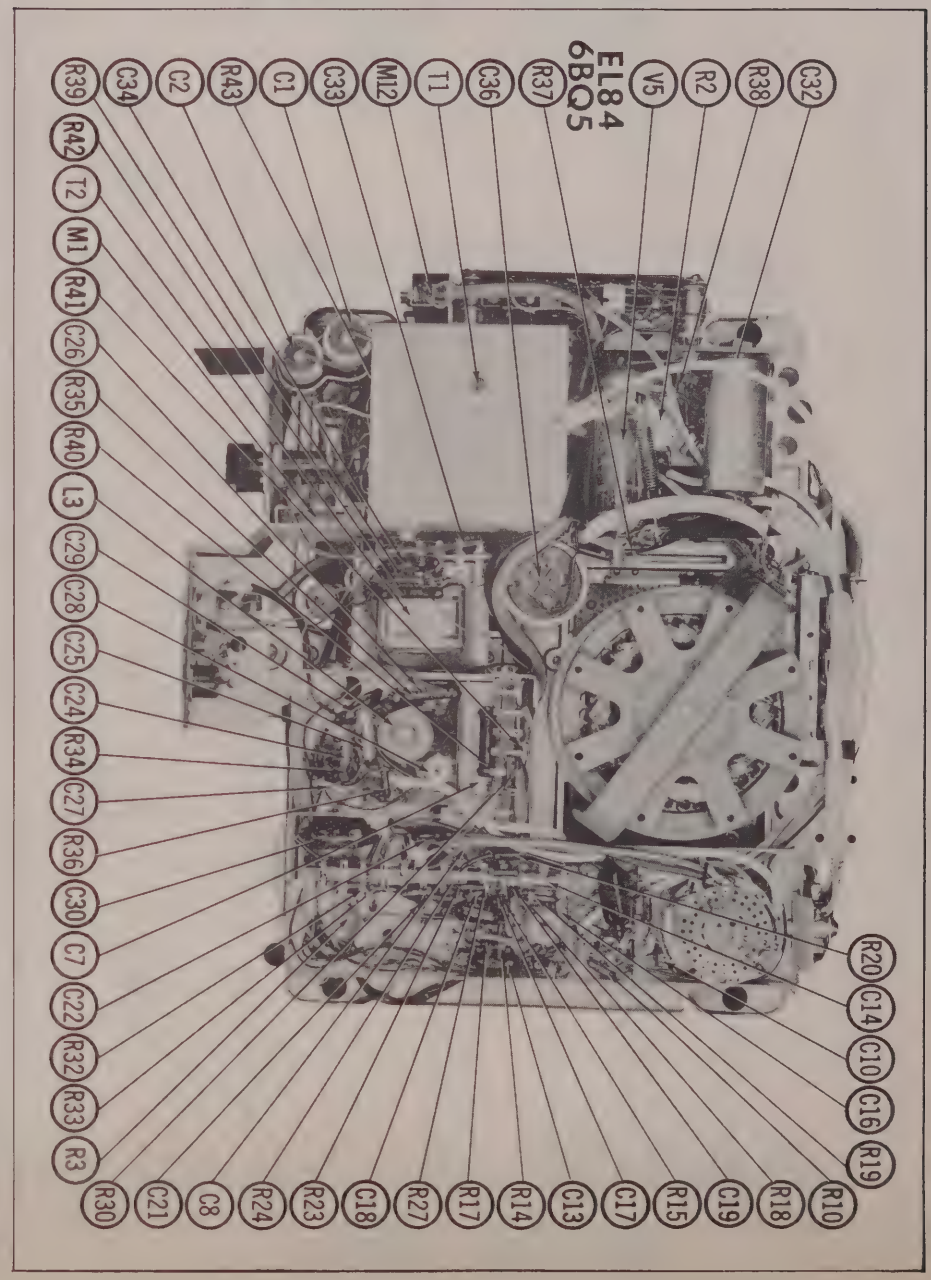
TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Grundig Majestic PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	220V Tap @150V, 146V, 110V 45V @.4A @220V .8A @117V	250 Vac @ .051A	6.3VCT @ 1.8A	BV9006-503						
		SEC. 3.	SEC.							
		6.3Vac @.2A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	GRUNDIG PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6800Ω	180Ω/5Ω	EV9054-502							

CHASSIS—BOTTOM VIEW



MODELS TK8, TK8/3D, TK8E, PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		Grundig Majestic PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Hum Pickup Coil	BV9281-007					Note 1
L2	40KC Trap	BV9281-003					
L3	Bias Osc.	BV9239-021					

Note 1 May not be used in some versions.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Grundig Majestic PART No.	QUAM PART No.	
SP1	6 1/4 x 4 3/8	PM	5Ω	0362-10		
SP2	3 1/2	PM	2-3Ω	0463-3		
SP3	3 1/2	PM	2-3Ω	0463-3		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	Grundig Majestic PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	051A			60-9150 ① ③ Alternate 61-4037	D-64 ②	① Selenium Type ② Silicon Type ③ 2-Reqd.
M2	Signal			U25HFP		Seleivium Diode

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Grundig Majestic PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG	2A 125V S/B			313002.	342003	MDL2	
M4	3AG	1/8A 125V S/B			313.125	342003	MDL 1/8	

MISCELLANEOUS

ITEM No.	PART NAME	Grundig Majestic PART No.	NOTES
M5	Erase Head	0628-139	
M6	Lamp		7V 0.3A., Indicator
M7	Switch	7481-004	Press Button Block, Slide Type
M8	Switch	0628-077	On-Off, Toggle Type
M9	Switch	0628-078	Change Over, Toggle Type
M10	Switch	7685-009	Rotary, 4 Wafer Type
M11	Switch		2 Speed
M12	Switch		Leaf Type
M13	Motor	5011-085	Motor Assembly

CABINETS & CABINET PARTS

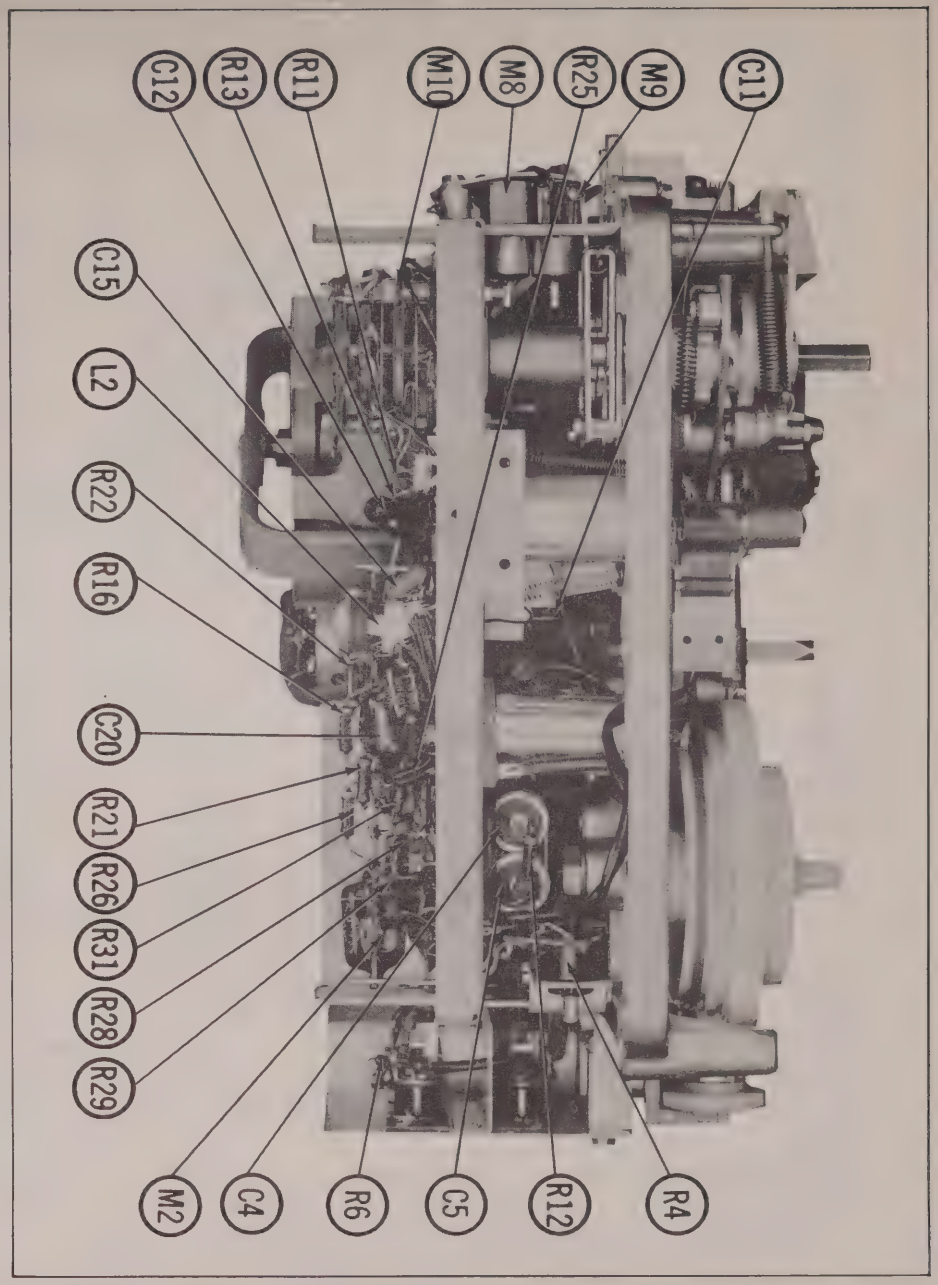
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	0628-213	Volume Control
Knob	0628-216	Selector
Knob	0628-228	Tone Control
Knob	0628-283	Temp. Stop
Knob	5011-043	2-Speed Selector
Pointer	0628-221	Indication, Plastic two used

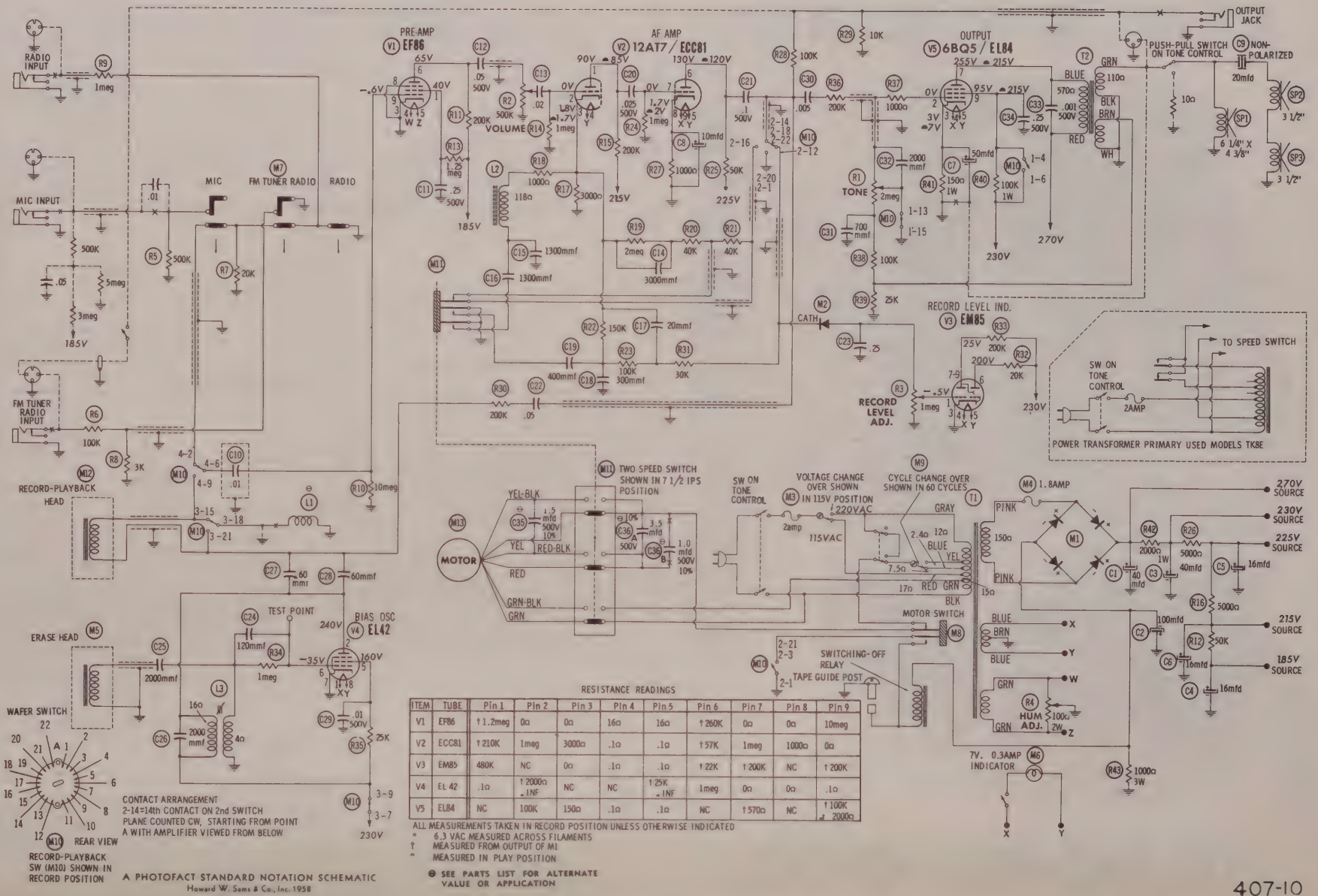
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—RIGHT SIDE



SCHEMATIC MODELS TK8, TK8E, TK8/3D



RESISTANCE READINGS

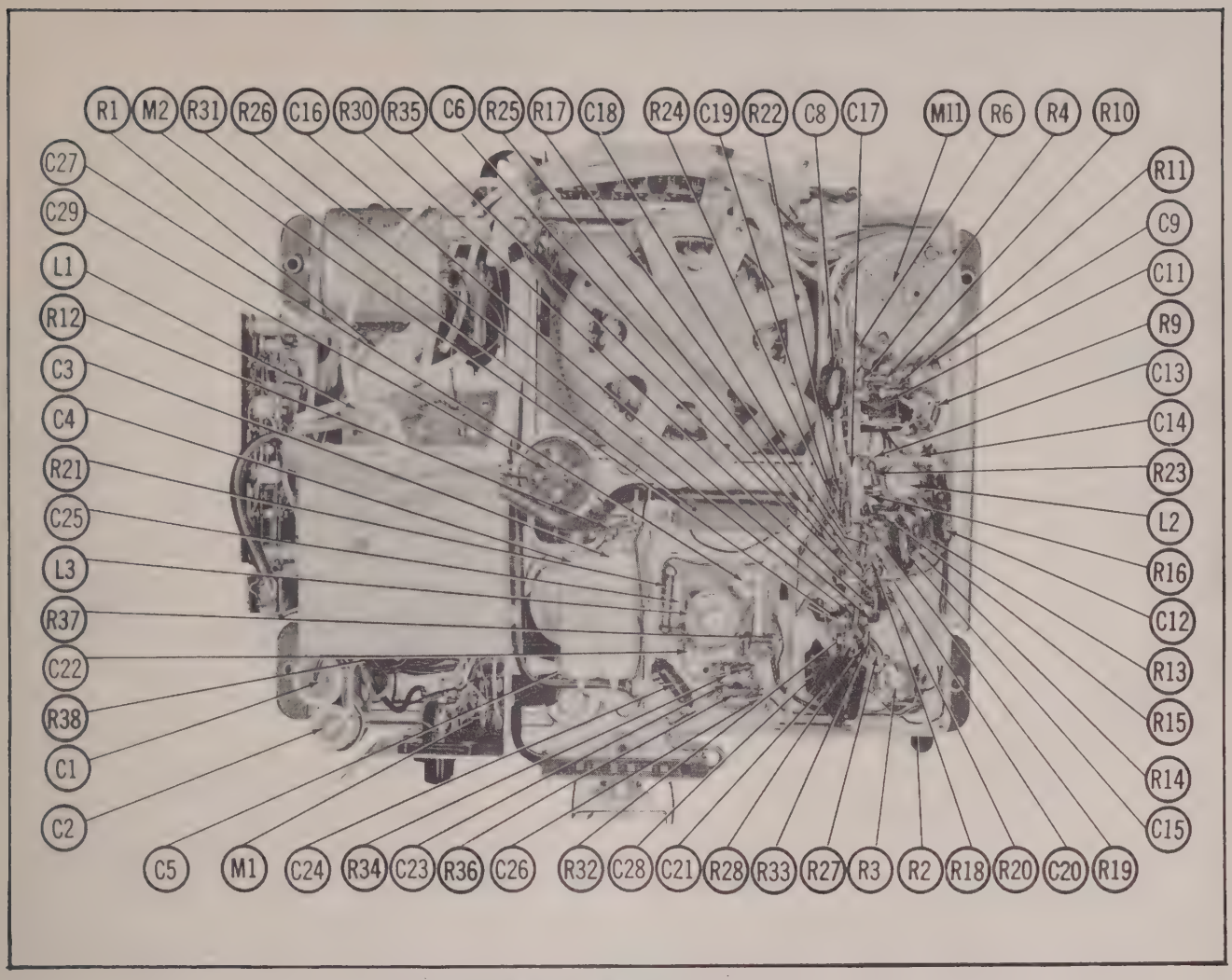
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	EF86	↑1.2meg	0Ω	0Ω	16Ω	16Ω	↑260K	0Ω	0Ω	10meg
V2	ECC81	↑210K	1meg	3000Ω	.1Ω	.1Ω	↑57K	1meg	1000Ω	0Ω
V3	EM85	480K	NC	0Ω	.1Ω	.1Ω	↑22K	↑200K	NC	↑200K
V4	EL 42	.1Ω	↑2000Ω ↓INF	NC	NC	↑25K ↓INF	1meg	0Ω	0Ω	.1Ω
V5	EL84	NC	100K	150Ω	.1Ω	.1Ω	NC	↑570Ω	NC	↑100K ↓2000Ω

ALL MEASUREMENTS TAKEN IN RECORD POSITION UNLESS OTHERWISE INDICATED
° 6.3 VAC MEASURED ACROSS FILAMENTS
↑ MEASURED FROM OUTPUT OF M1
- MEASURED IN PLAY POSITION

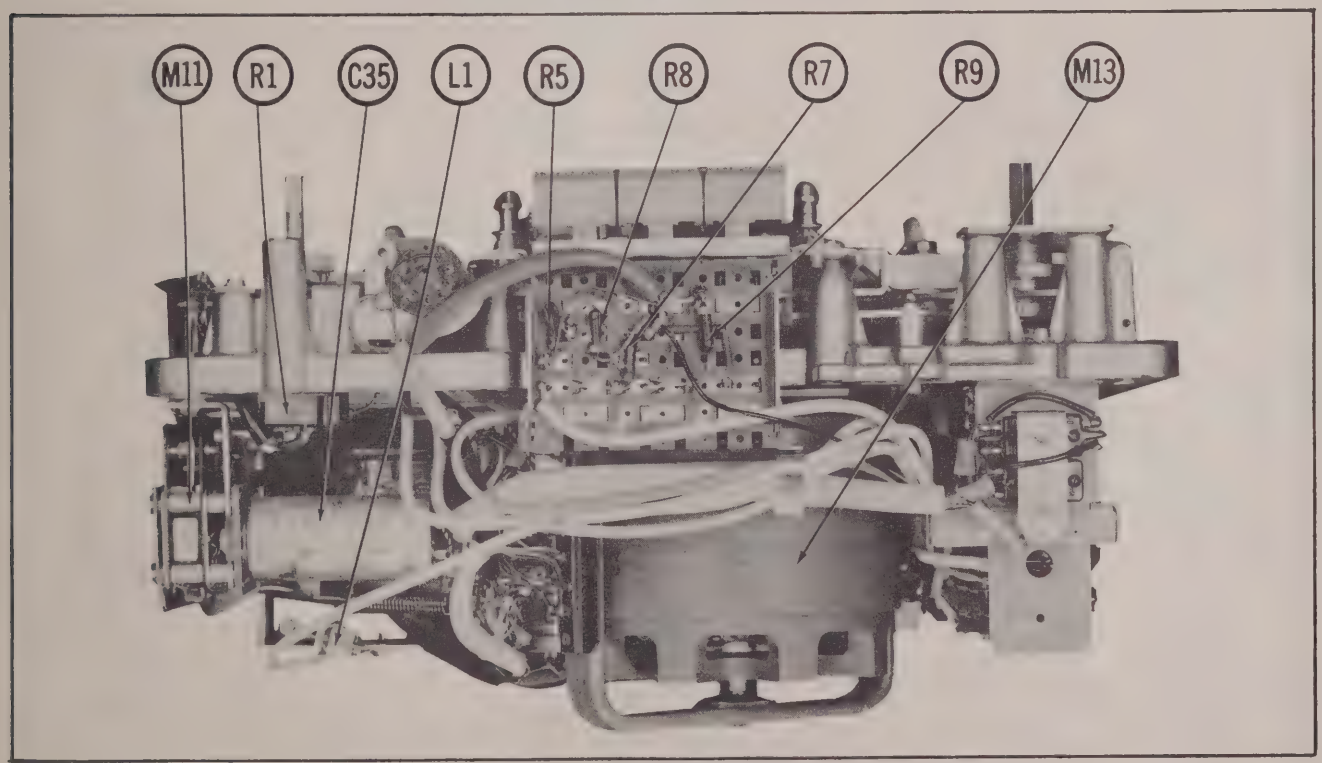
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

407-10



CHASSIS-BOTTOM VIEW MODELS TM8, TM8E, TM8U



CHASSIS-FRONT VIEW MODELS TK8, TK8E, TK8/3D

MODELS TM8, TM8E, TM8U PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Pre Amp.	EF86
V2	AF Amp.	12AT7/ ECC81

ITEM No.	USE	TYPE	NOTES
V3	Record Level Indicator	EM85	
V4	Bias Osc.	EL42	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Grundig Majestic PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	385		PRS450V40	BR4045	TC78	TD-40-450		TVA-1712
C2	100	80		PRS150V100	BR10015		TD-100-150		TVA-1420
C3	16	385		PRS450V16	BR1645	TC74	TD-16-450	MT-4516	TVA-1708
C4	16	385		PRS450V16	BR1645	TC74	TD-16-450	MT-4516	TVA-1708
C5	16	385		PRS450V16	BR1645	TC74	TD-16-450	MT-4516	TVA-1708
C6	10	15		XPP-15010	NL10-15	TT15X10	ML10-15		TE-1155

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

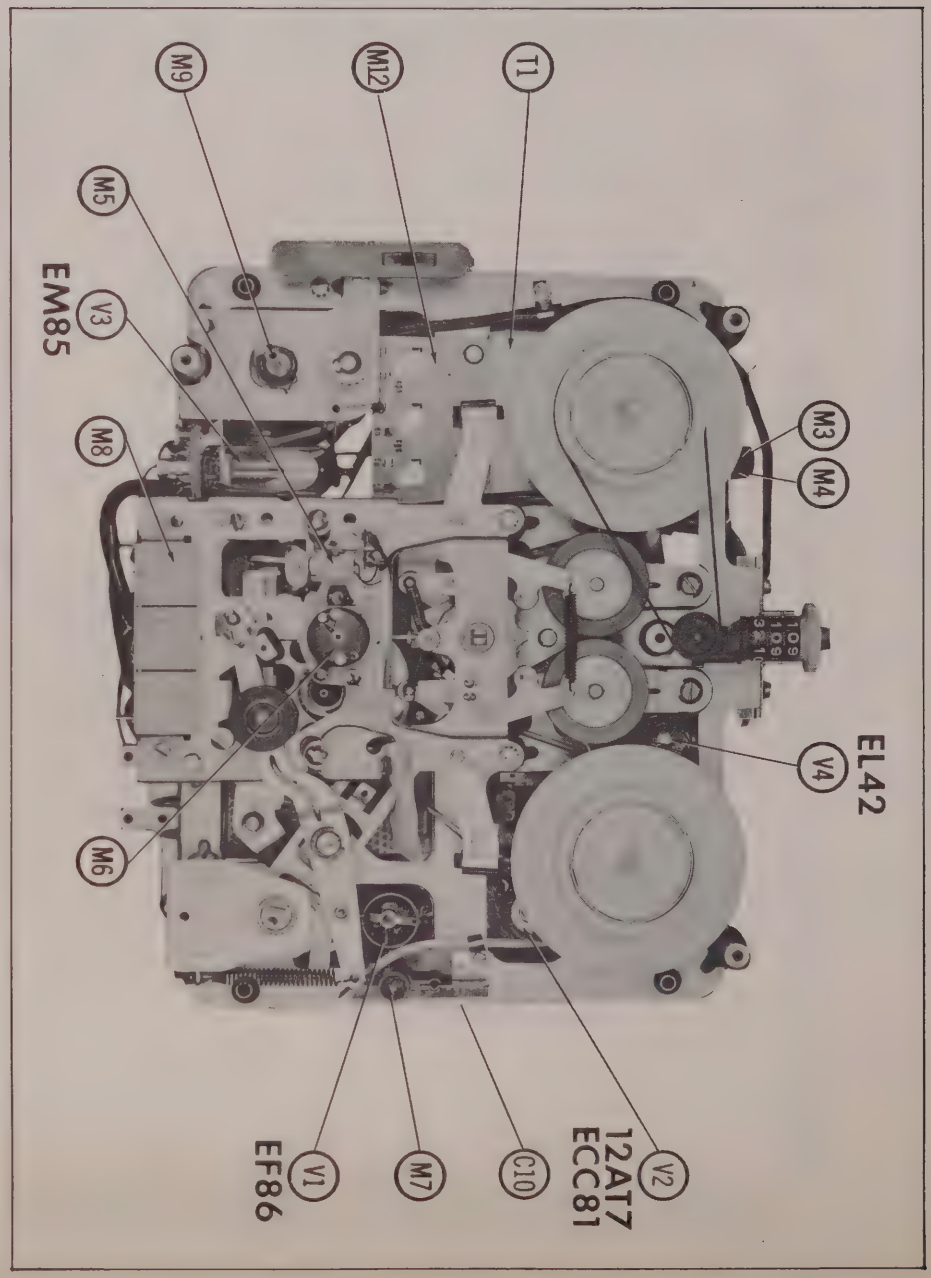
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Grundig Majestic PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	.01	250		P488N-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C8	.05	250		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C9	.01	250		P488N-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C10	.25	500		P688N-25		CUB6P25		GEM-6025	6TM-P25	
C11	.05	500		P688N-05	DF-503	CUB6S5		GEM-615	6TM-S5	
C12	.02	125		P488N-02	DD-203	CUB4S2	ED-02	GEM-412	2TM-S2	
C13	1300			1467-0013	DD-132	1W5D13	CY20C132J		1FM-213	
C14	1300			1467-0013	DD-132	1W5D13	CY20C132J		1FM-213	
C15	.025	500		P688N-025		CUB6S22		GEM-6125	6TM-S25	
C16	.1	500		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C17	3000			1467-003	DD-302	1W5D3	ED-003	MC461	1FM-23	
C18	300			1468-0003	DD-301	5W5T3	ED-300	MC241	1FM-33	
C19	400			1468-0004	DD-401	5W5T4		MC243	1FM-34	
C20	20			1468-00002	DD-200	5W5Q2	ED-20	UC542	1FM-42	
C21	.25	125		P288N-25		CUB4P25		GEM-4025	2TM-P25	
C22	2000			1467-002	DD-202	1W5D2	ED-002	MC457	1FM-22	
C23	120			1468-00012	DD-121	5W5T12	ED-120		1FM-312	
C24	.01	500		P688N-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C25	2000			1467-002	DD-202	1W5D2	ED-002	MC457	1FM-22	
C26	30			1468-00003	DD-300	5W5Q3	ED-30		1FM-43	①
C27										
C28	.05	125		P288N-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C29A	1									② Dual
C29B	2									② Dual
C30A	1.5									③ Dual
C30B	4									③

① Model TM8 uses 40mmf in this application
② In Model TM8 C29B is not used.
③ In Model TM8 C30A is not used and C30B is 3.5mmf.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Grundig Majestic PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	500K	½	0628-016					Volume
R2	1meg	½	0629-017					Record Level Adj.
R3	100Ω	2(WW)						Hum Adj. Wire Wound

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Grundig Majestic PART No.	NOTES
R4	5meg			
R5	500K			
R6	3meg			
R7	20K			
R8	5meg			
R9	10meg			
R10	200K			
R11	1.25meg			
R12	50K			
R13	1meg			
R14	3000Ω			
R15	200K			
R16	1500Ω			
R17	5000Ω			
R18	1meg			
R19	1000Ω			
R20	50K			
R21	25K			
R22	40K			
R23	2meg			
R24	150K			
R25	100K			
R26	5000Ω			
R27	3000Ω			
R28	100K			
R29	1meg			
R30	30K			
R31	30K	10W		
R32	200K			
R33	20K			
R34	1meg			
R35	25K			
R36	500Ω			
R37	200K			
R38	1600Ω	1		

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RATING SEC. 5	REPLACEMENT DATA Grundig Majestic PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	240VAC Taps @ 230, 220, 182, 153, 143, 140, 117, 18VAC 6A @ 117V 3A @ 220V	235VAC @ .015A	6.3VCT @ 1.1A	6.3VAC @ 2A		BV9006-505						

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Grundig Majestic PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Hum Pickup Coil	BV9281-007				Note 1
L2	Trap Coil	BV9281-003				
L3	Bias Osc.	BV9239-021				

Note 1 May not be used in some versions

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA Grundig Majestic PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.0165A	B250C75 ①		61-4037 ①	①126-10B1-Q D-64②	① Selenium Type ②Silicon Type
M2	Signal	E25C5 ①		U20HFP		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Grundig Majestic PART No. FUSE	Grundig Majestic PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	Slo-Blow	1A250V						
M4	Slo-Blow	08A 250V						

MISCELLANEOUS

ITEM No.	PART NAME	Grundig Majestic PART No.	NOTES
M5	Erase Head	0628-139	
M6	Record Head	BV1379	
M7	Lamp		7V. 0.3A. Indicator
M8	Switch	7481-004	Press Button Block, Slide Type
M9	Switch	0628-077	Power, On-Off, SPST, Rotary Type
M10	Switch	0628-078	Change Over, Slide Type
M11	Switch	7685-009	Rotary Wafer Type, 4 Wafers
M12	Switch	9625-056	Voltage Input Selector, 5 Position
M13	Motor	5011-085	Assembly, 60 Cycle

CABINETS & CABINET PARTS

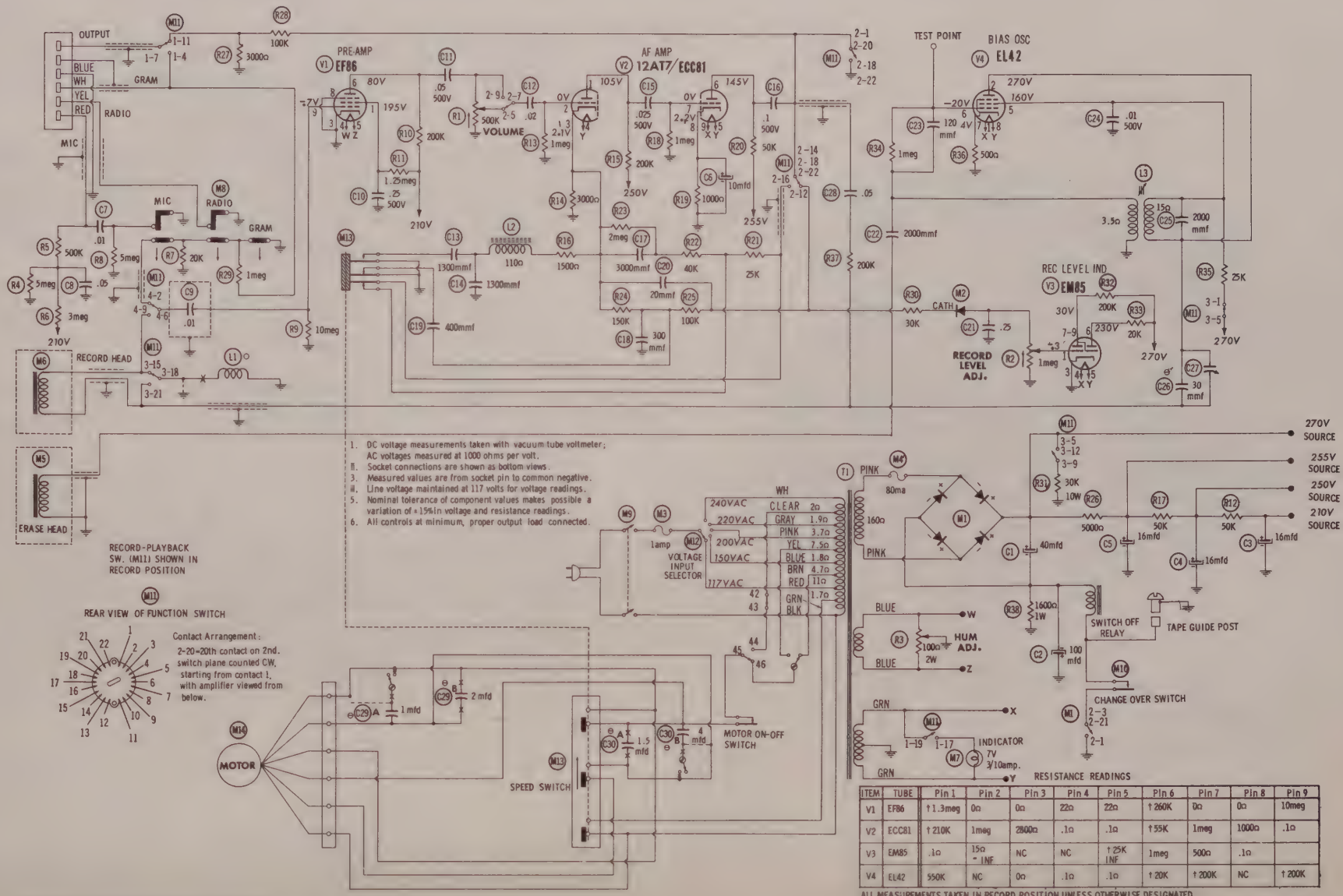
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	0628-213	Volume Control
Knob	0628-228	Tone Control
Knob	0628-283	Temp. Stop
Knob	5011-043	Two Speed Selector
Knob	5011-083	Selector, Right Hand
Button	0628-287	Press
Cabinet	5011-070	Less Speakers

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

SCHEMATIC MODELS TM8, TM8E, TM8U



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

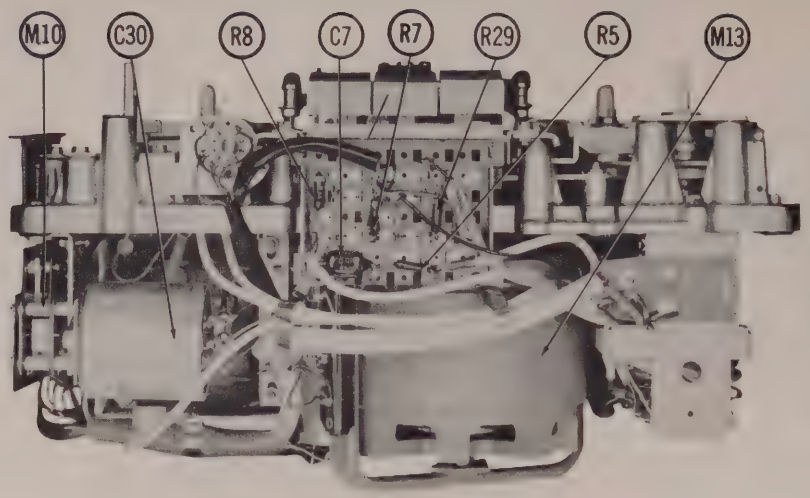
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	EF86	†1.3meg	0Ω	0Ω	22Ω	22Ω	†260K	0Ω	0Ω	10meg
V2	ECC81	†210K	1meg	2800Ω	.1Ω	.1Ω	†55K	1meg	1000Ω	.1Ω
V3	EM85	.1Ω	15Ω - INF	NC	NC	†25K INF	1meg	500Ω	.1Ω	
V4	EL42	550K	NC	0Ω	.1Ω	.1Ω	†20K	†200K	NC	†200K

ALL MEASUREMENTS TAKEN IN RECORD POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM OUTPUT OF M1
- MEASURED IN PLAY POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

407-10

SCHEMATIC MODEL TK5



CHASSIS-FRONT VIEW TM8, TM8E TM8U

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	0628-229	Knob Securing Brass Screws	41	5007-108	R.H. Fast Wind Roller
2	0628-230	Compression Spring	42		"C" Washers
3	0628-216	Selector Knob (Specify Color)	43		Washers
4	0628-283	Temporary Stop Button (Specify Color)	44	5007-102	L.H. Fast Wind Lever
			45	5007-107	R.H. Fast Wind Lever
5	0628-215	Fast Wind Operating Knob (Specify Color)	46	0628-053	Cam Lever
			47		Retainer (2)
6	9628-217	Removable Plastic Head Cover (Specify Color)	48	0628-049	Tension Spring for Fast Wind Lever-25 windings
7	0628-228	Tone Control Knob (Specify Color)	49	0628-056	Tension Spring for Fast Wind Lever-24 windings
8		Felt Washer			
9	0628-213	Volume Control Knob (Specify Color)	50	0628-087	Interlock Bar Ass'y.
			51		Interlock Spring
10	5011-043	Two-Speed Selector Knob (Specify Color)	52	0628-052	Fast Wind Cam
			53	0628-051	Locking Disc
11	5011-006	Top Deck Ass'y (Specify Color)	54		Detent
12		Screw	55		Detent Spring
13		Washer	56		Screws
14	0628-174	Pressure Roller	57	5011-031	Mounting Plate
15	0628-166	Pressure Roller Arm	58	0628-082	Cam, Pressure Arm
16	0628-116	Pressure Roller Arm Spring	59	0628-081	Cam, Interlock Bar
17		Retainer	60	0628-092	Tension Spring for Brake Lever Flap
18	0628-171	Pressure Pad Bracket with Felt Ring	61	0628-080	Cam, Brake for Tape
			62	0628-083	Brake Lever Ass'y.
19	0628-173	Torsion Spring for Pressure Pad Bracket	63		L.H. Fast Wind Roller Pulley
			64	0628-009	Drive Belt (Large)
20	0628-043	Clutch Spring Ring (2)	65	5011-049	Drive Belt (Small)
21	0628-042	Upper Clutch Spindle	66	0628-047	Lower Clutch Half R.H. (Driven)
22	5DIN6799	"C Washer (2)	67	0628-036	Lower Clutch Half L.H. (Stationary)
23	0628-207	Steel Washer			
24	0628-044	Upper Clutch Half	68	5011-019	Counter
25		Counter Belt	69	0628-026	Bolt Square (for Fast Wind Knob)
26	5007-112	Brake Lever Tension Spring	70	0628-027	Bolt Square
27	5011-041	L.H. Brake Lever Ass'y.	71	5011-002	Cast Top Frame
28	5011-039	R.H. Brake Lever Ass'y.	72	0628-019	Base Plate
29	0628-096	Center Mounting Top Plate	73	0254-041	Washers (3)
30		Mounting Screws	74	0628-022	Locking Discs (2)
31	0628-105	Leather Stop (2)	75		Locking Disc Detents (2)
32	0628-124	Tape Guide, Large, Insulated	76	0628-079	Double Trip Cam (Metal)
33	0628-120	Tape Guide, Large			Double Trip Cam (Plastic)
34		Record-Playback Head	77		Detent Spring
35	0628-139	Erase Head	78	5011-085	Motor Ass'y.
36	0628-108	Flap	79		"C" Washer
37	0628-109	Felt Pad Ring	80		Bolt
38	0628-111	Torsion Spring for Flap	81		Motor Mounting Screws
39	0628-068	Temporary Stop Lever	82	0628-222	Plastic Escutcheon for Magic Eye
40	5007-106	L.H. Fast Wind Roller			

PHOTOFACT* Folder

GRUNDIG MAJESTIC MODELS
8058, 8068, 8095, 8098

GRUNDIG MAJESTIC MODELS
8058, 8068, 8095, 8098

GRUNDIG MAJESTIC MODELS
8058, 8068, 8095, 8098

TRADE NAME	Grundig Majestic Models 8058, 8068, 8095, 8098			
SUPPLIER	Majestic International Sales Corp., 743 W. LaSalle St., Chicago 10, Illinois			
TYPE SET	AC Operated FM-BC-SW Receiver With 4 Speed Automatic Record Changer			
TUBES (Nine)	Types 6AQ8/ECC85 FM RF Amp.-FM Conv., 6AJ8/ECH81 1st. FM IF Amp.-AM Conv., EBF89 2nd. FM IF Amp.-1st. AM IF Amp.-AM Det.-AVC, EAA91 Ratio Det., 6CD7/EM34 Tuning Ind., 12AT7/ECC81 Phono Preamp.-AF Amp., 12AX7/ECC83 AF Amp.-Phase Inv., (2) EL95 Output			
POWER SUPPLY	110(or) 220 Volts AC-60 Cycles		RATING .5 Amp. @ 117 Volts AC (50 Watts Less Motor)	
TUNING RANGE	Broadcast	510-1620KC	Shortwave I	3.2 8.5MC
	Freq. Mod.	88-108MC	Shortwave II	8.5-18.5MC

RECORD CHANGER - PERPETUUM EBNER MODEL REX DELUXE
TAPE TRANSPORT - GRUNDIG MAJESTIC MODEL TM8U

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of H441

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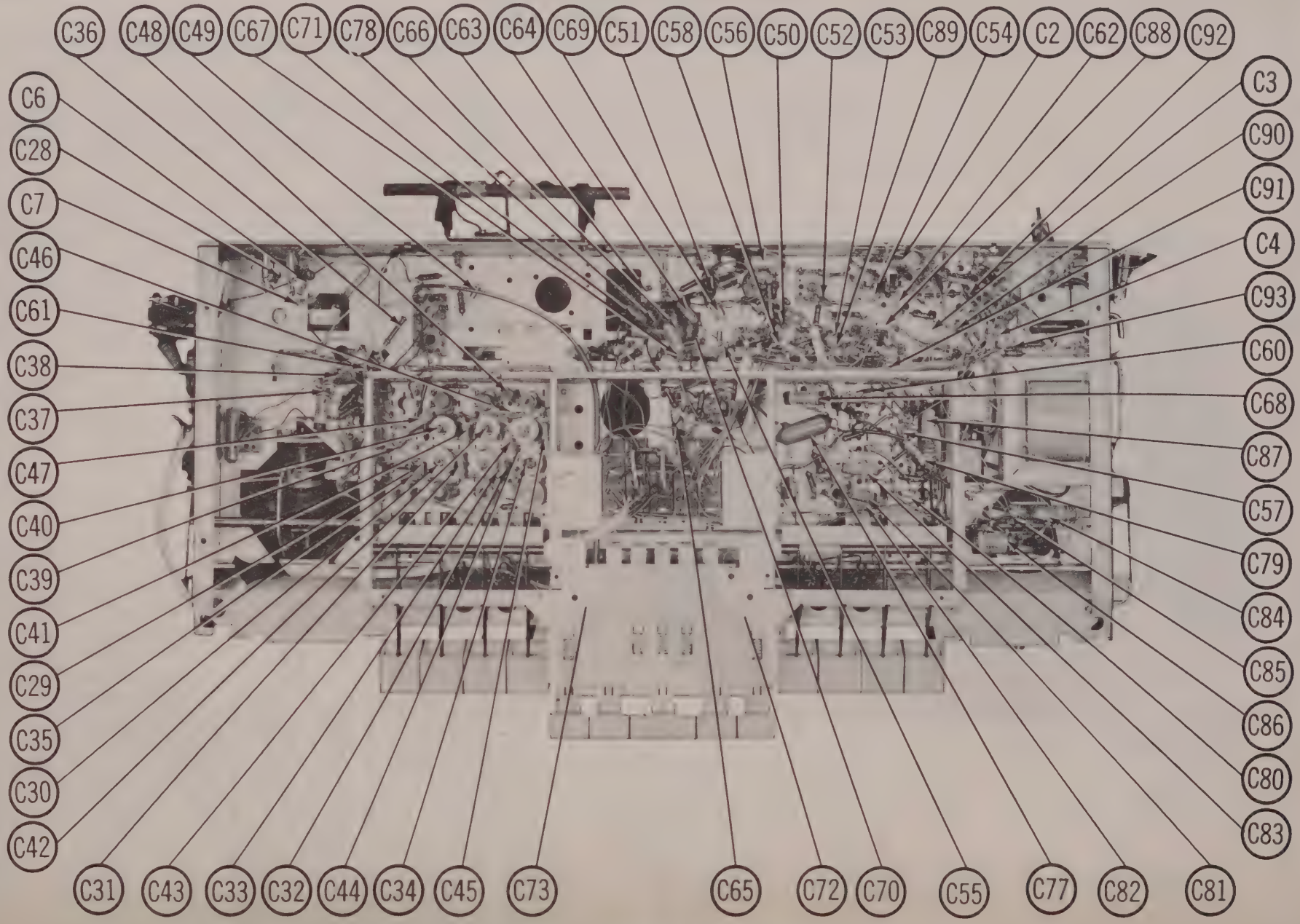
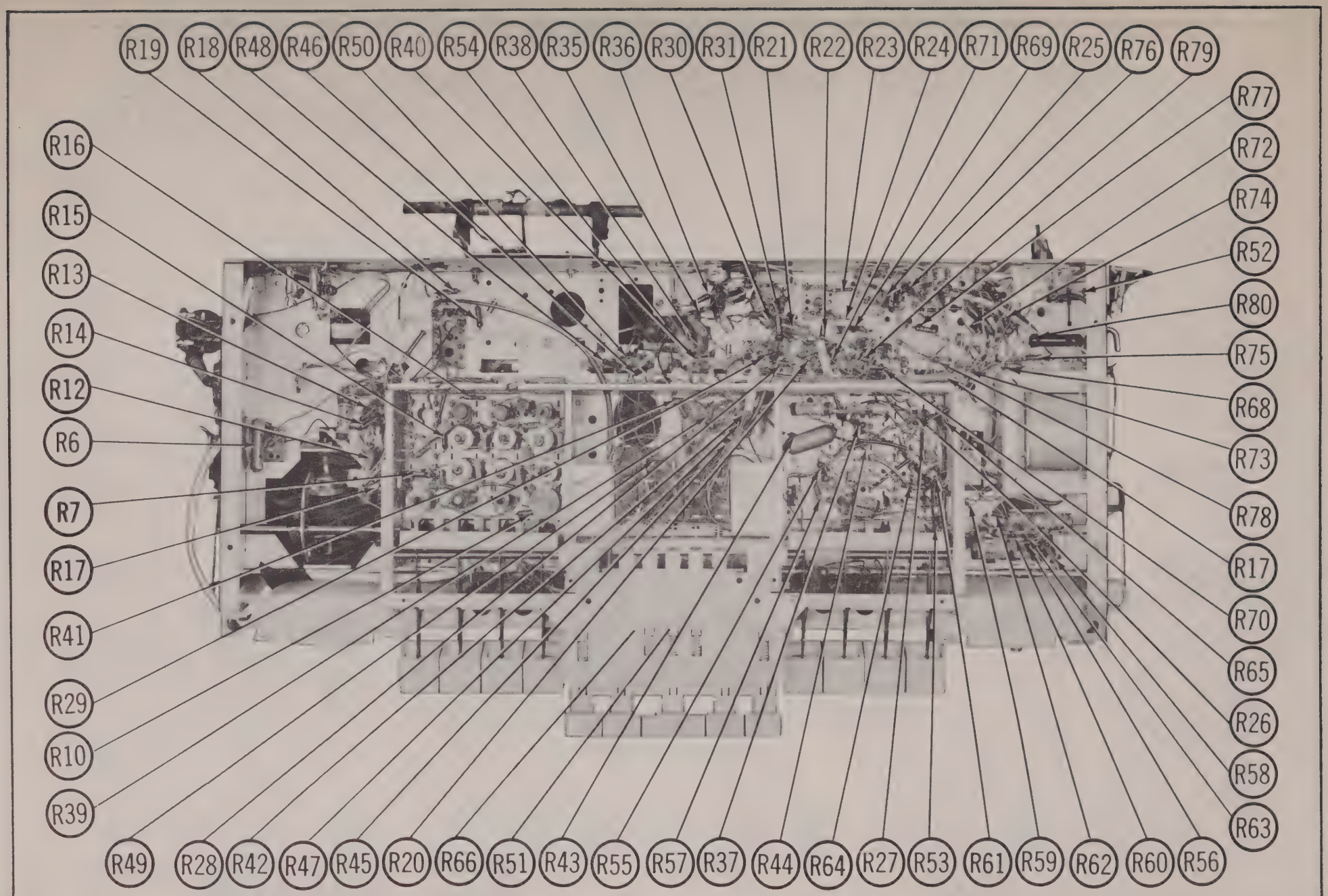
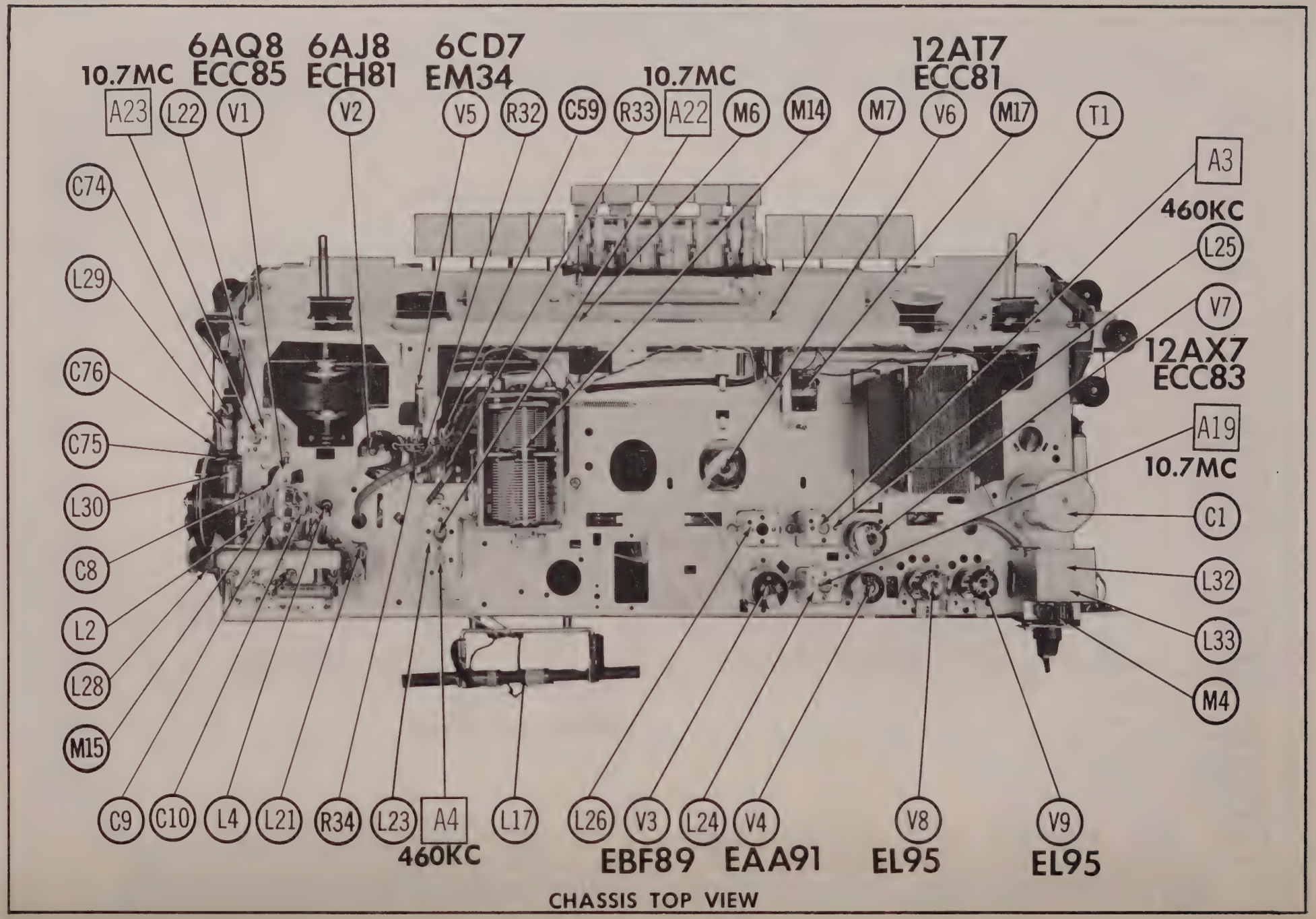


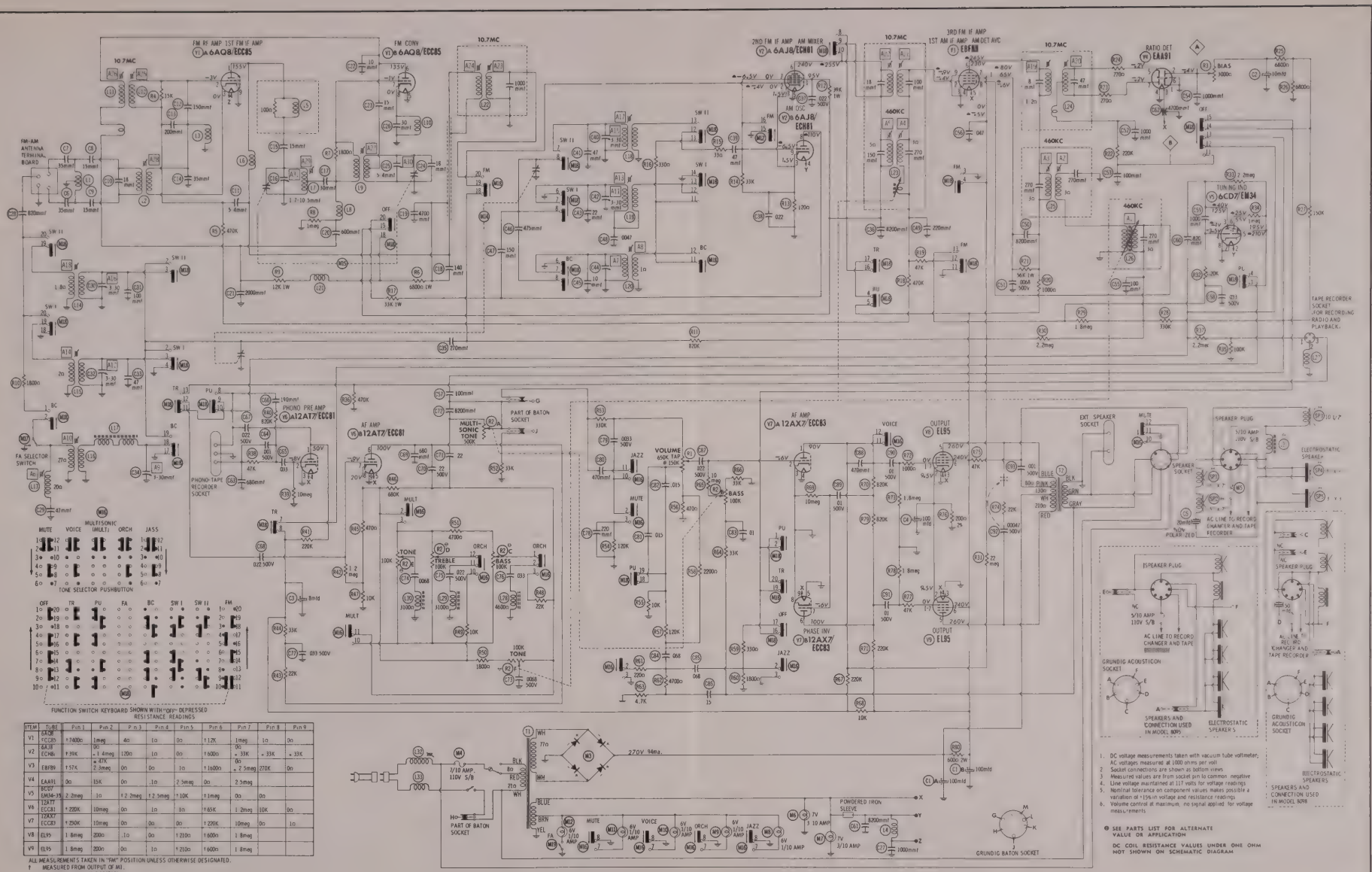
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS TOP VIEW



ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AQ8 ECC85	†74000	1meg	4Ω	1Ω	0Ω	†12K	1meg	1Ω	0Ω
V2	6AJ8 ECH81	†39K	20 = 1.4meg	120Ω	1Ω	0Ω	†600Ω	20 = 33K ▫ 33K	▫ 33K	
V3	EBF89	†57K	= 47K ▫ 3meg	0Ω	0Ω	1Ω	†1600Ω	0Ω = 2.5meg	270K	0Ω
V4	EAA91	0Ω	15K	0Ω	1Ω	2.3meg	0Ω	2.5meg		
V5	6CD7/ EM34-35	2.2meg	1Ω	†2.2meg	†2.5meg	†10K	†1meg	0Ω	0Ω	
V6	12AT7 ECC81	†220K	10meg	0Ω	1Ω	1Ω	†65K	1.2meg	10K	0Ω
V7	12AX7 ECC83	†250K	10meg	0Ω	0Ω	0Ω	†220K	10meg	0Ω	1Ω
V8	EL95	1.8meg	200Ω	1Ω	0Ω	†210Ω	†600Ω	1.8meg		
V9	EL95	1.8meg	200Ω	0Ω	1Ω	†210Ω	†600Ω	1.8meg		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM OUTPUT OF A1.
▫ MEASURED IN "AM" POSITION.
▪ MEASURED FROM PIN 8 OF V6.

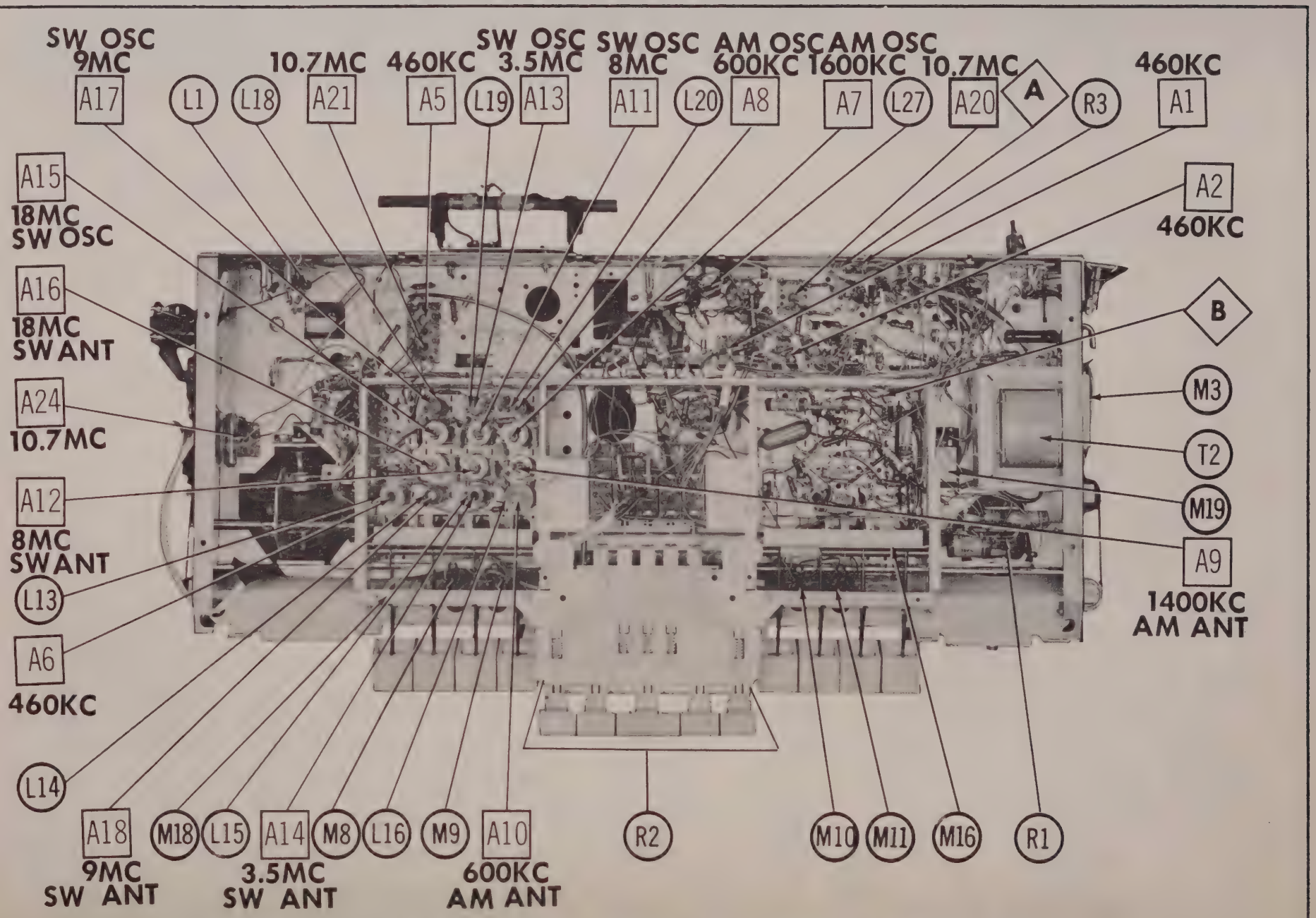
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

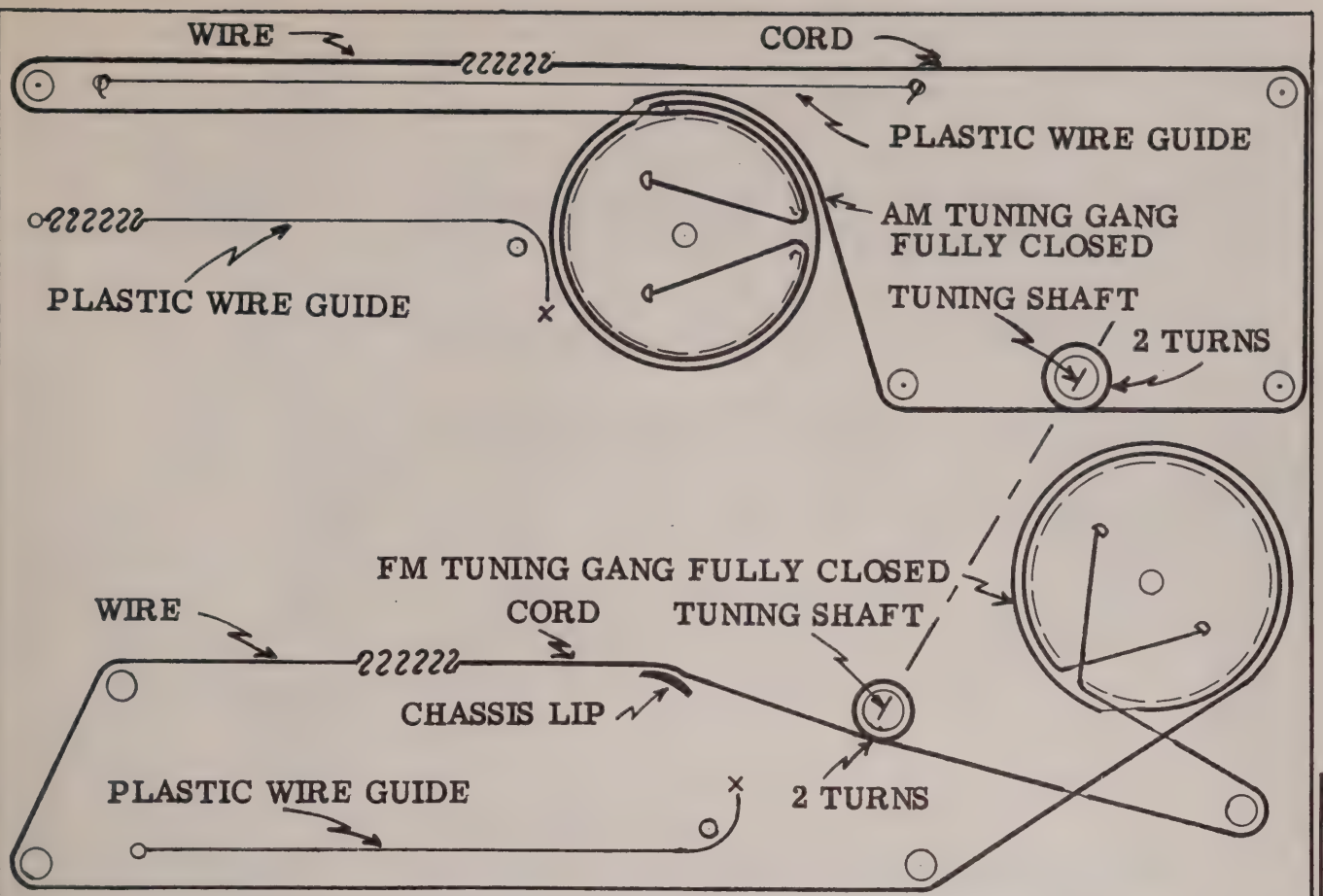
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

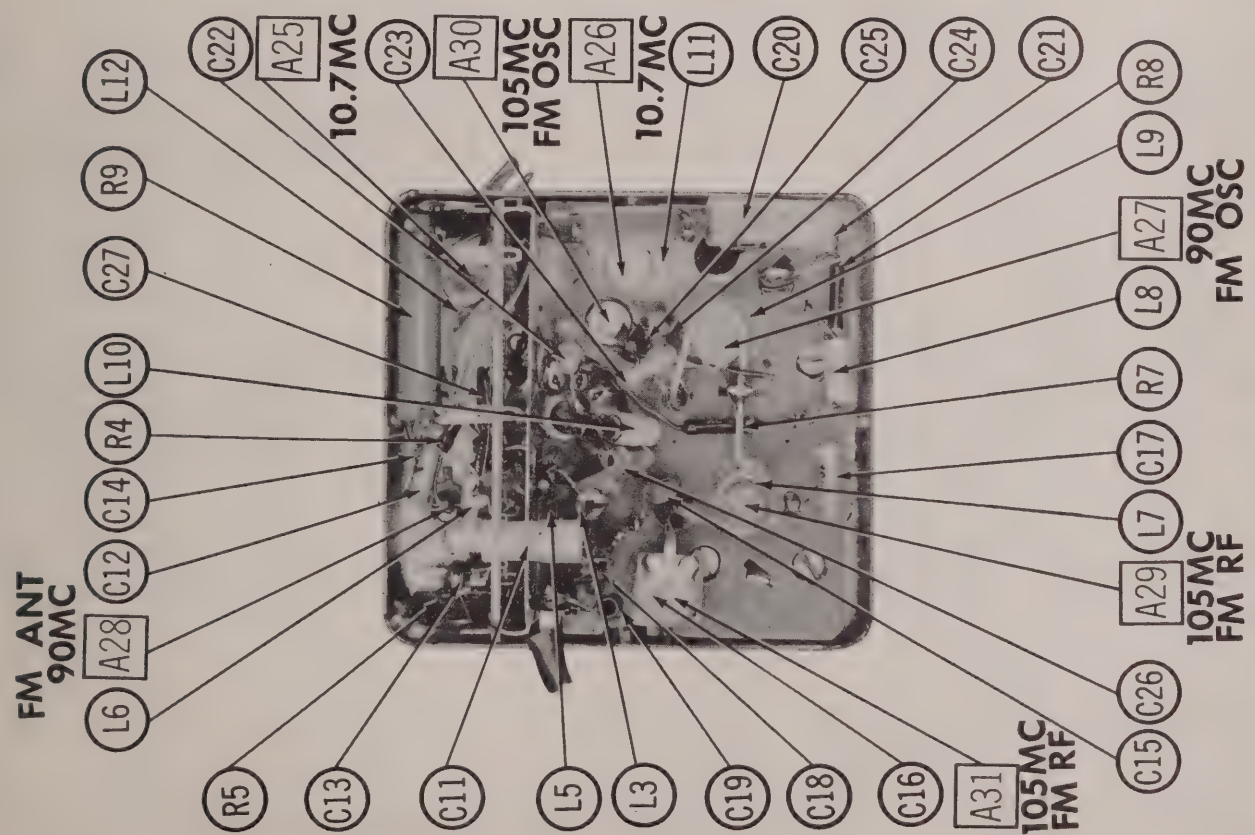
407-11



CHASSIS BOTTOM VIEW - ALIGN., INDUCTOR, RESISTOR & MISC. IDENT.



FM-AM DIAL CORD STRINGING



FM RF SUB-CHASSIS

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM RF Amp. -1st. FM IF Amp. -FM Conv.	6AQ8/ECC85
V2	2nd. FM IF Amp. - AM Mixer-AM Osc.	6AJ8/ECH81
V3	3rd. FM-1st. AM IF Amp. - AM Det. -AVC	EBF89
V4	Ratio Detector	EAA94
V5	Tuning Indicator	6CD7/EM34
V6	Phono Preamp. -AF Amp.	12AT7/ECC81
V7	AF Amp. -Phase Inv.	12AX7/ECC83
V8	Output	EL95
V9	Output	EL95

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Grundig Majestic PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	100	385		AFH2-41-50	B0332	FP227.7	TMT-165	Q-025	TVL-2641
B	100	385						MT-4580	
C2	10	80		PRS150V10	BBR10-90	TC42	TD-10-150	MT-1510	TVA-1406
C3	8	385		PRS450V8	BR845	TC71	TD-8-450	MT-4508	TVA-1704
C4	100	15		PRS15V100	BBR100-15	TC2501	TD-100-15	MTH-1510	TVA-1160
C5	20	40NP	0820-150 ①	NP-PRS300	BR4015 †	TC48 †	TD-40-150†	MT-1540 †	R2570 *
				V20	BR4015 †	TC48 †	TD-40-150†	MT-1540 †	

① Not used in Model 8098. † Connect negative leads together. * Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Grundig Majestic PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	35								
C7	35								
C8	15			SI 15	D6-150	LT6Q15	UC-5415	5GA-Q15	
C9	15			SI 15	D6-150	LT6Q15	UC-5415	5GA-Q15	
C10	18			SI 18	D6-180	LT6Q18	UC-5418	5GA-Q18	
C11	.5-4								
C12	150			SI 150	D6-151	LT6T15	UC-5315	5GA-T15	
C13	200			1468-0002	DD-201	5W5T2	MC237	1FM-32	
C14	35								
C15	15			BPD-000015	DD-150	L10Q15	UC-5415	5GA-Q15	
C16	1.7-10.5								
C17	30			SI 30				5GA-Q3	
C18	140								
C19	4700			SI 4700	D6-472	LT6D47	UC-5247	5GA-D47	
C20	600			1468-0006	DD-601	1W5T6			
C21	2000			SI 2000	DD-202	1W5D2	MC457	1FM-22	
C22	10			SI 10	D6-100	LT6Q1	UC-541	5GA-Q1	
C23	15			SI 15	D6-150	LT6Q15	UC-5415	5GA-Q15	
C24	18			SI 18	D6-180	LT6Q18	UC-5418	5GA-Q18	
C25	.5-4								
C26	30			SI 30				5GA-Q3	
C27	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C28	820			1468-00082	DD-821	1W5T82		1FM-382	
C29	47			1468-000047	DD-470	5W5Q47		1FM-447	
C30	3-30								
C31	100			SI 100	D6-101	LT6T1	UC-531	5GA-T1	
C32	3-30								
C33	47			SI 47	D6-470	LT6Q47	UC-541	5GA-Q47	
C34	3-30								
C35	270			1468-00027	DD-271	5W5T27		1FM-327	
C36	8200								
C37	.022	500		P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C38	.022	125		P288N-022	DD-203	CUB4S22	GEM-4122	2TM-S22	
C39	47			1468-000047	DD-470	5W5Q47		1FM-447	
C40	3-30								
C41	47			SI 47	D6-470	LT6Q47	UC-5447	5GA-Q47	
C42	3-30								
C43	22			SI 22	D6-220	LT6Q22	UC-5422	5GA-Q22	
C44	3-30								
C45	10			SI 10	D6-100	LT6Q1	UC-541	5GA-Q1	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Grundig Majestic PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C46	475								
C47	150			SI 150	D6-151	LT6T15	UC-5315	5GA-T15	
C48	.0047	125		P288N-0047	D6-472	CUB6D47		6TM-D47	
C49	220			1468-00022	DD-221	5W5T22	UC-5322	1FM-322	
C50	8200								
C51	.0068	500		P688N-0068	D6-682	CUB6D68	GEM-6268	6TM-D68	
C52	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C53	100			1468-0001	DD-101	5W5T1	MC230	1FM-31	
C54	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C55	100			1468-0001	DD-101	5W5T1	MC230	1FM-31	
C56	.047	125		P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C57	100			1468-0001	DD-101	5W5T1	MC230	1FM-31	
C58	.033	500		P688N-033		CUB6S33	GEM-4133	6TM-S33	
C59	1000			1468-001	DD-102	1W5D1	MC255	1FM-21	
C60	820			1468-00082	DD-821	1W5T82		1FM-382	
C61	8200								
C62	4700								
C63	680			1468-00068	DD-681	1W5T68		1FM-368	
C64	.001	500		P688N-001	D6-102	CUB6D1	GEM-621	6TM-D1	
C65	.033	250		P688N-033		CUB6S33	GEM-4133	6TM-S33	
C66	190								
C67	.022	500		P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C68	.022	500		P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C69	680			1468-00068	DD-681	1W5T68		1FM-368	
C70	.22	500		P688N-22		CUB6P22	GEM-6022	6TM-P22	
C71	.22	125		P288N-22		CUB4P22	GEM-2022	2TM-P22	
C72	8200								
C73	.0068	500		P688N-0068	D6-682	CUB6D68	GEM-6268	6TM-D68	
C74	.0068	250		P488N-0068	D6-682	CUB6D68	GEM-6268	6TM-D68	
C75	.022	500		P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C76	.033	250		P488N-033		CUB6S33	GEM-4133	6TM-S33	
C77	.033	500		P688N-033		CUB6S33	GEM-6133	6TM-S33	
C78	220			1468-00022	DD-221	5W5T22		1FM-322	
C79	.0033	500		P688N-0033		CUB6S33	GEM-6233	6TM-D33	
C80	470			1468-00047	DD-471	5W5T47		1FM-347	
C81	.015	250		P488N-015		CUB6S15	GEM-4115	4TM-S15	
C82	.015	250		P488N-015		CUB6S15	GEM-4115	4TM-S15	
C83	.01	250		P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C84	.068	250		P488N-068		CUB4S68	GEM-4168	4TM-S68	
C85	.068	250		P488N-068		CUB4S68	GEM-4168	4TM-S68	
C86	.15	125		P288N-15		CUB4P15	GEM-2115	2TM-P15	
C87	.022	500		P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C88	470			1468-00047	DD-471	5W5T47		1FM-347	
C89	.01	500		P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C90	.01	500		P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C91	.01	500		P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C92	.00047	500							
C93	.001	500		P688N-001	D6-102	CUB6D1	GEM-621	6TM-D1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Grundig Majestic PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	650K	½	7801-041					Volume, Tap @ 150K
R2A	500K	½	7806-152					Multisonic Tone
B	100K	½						Bass
C	100K	½						Bass, Note 1
D	100K	½						Treble, Note 1
E	100K	½						Tone, Note 1
F	100K	½						Tone, Note 1
R3	3000Ω	½	6637					Bias

Note 1. Control open in center, 50K each side of center.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Grundig Majestic PART No.	NOTES
R4	15K			
R5	470K			
R6	6800Ω	1		
R7	1800Ω			
R8	1meg			
R9	12K	1		
R10	1800Ω			
R11	820K			
R12	39K	1		
R13	120Ω			
R14	33K			
R15	33Ω			
R16	330Ω			
R17	33K	1		
R18	470K			
R19	47K			
R20	1000Ω			
R21	56K	1		
R22	220K			
R23	270Ω			
R24	270Ω			
R25	6800Ω			
R26	6800Ω			
R27	150K			
R28	330K			
R29	1.8meg			
R30	2.2meg			
R31	22meg			
R32	820K			
R33	2.2meg			
R34	1meg			
R35	100K			
R36	470K			
R37	2.2meg			
R38	47K			
R39	10meg			
R40	820K			
R41	220K			
R42	1.2meg			
R43	22K			
R44	33K			
R45	470Ω			
R46	680K			
R47	10K			
R48	22K			
R49	10K			
R50	1800Ω			
R51	4700Ω			
R52	33K			
R53	330K			
R54	120K			
R55	10K			
R56	470Ω			
R57	120K			
R58	2200Ω			
R59	330Ω			
R60	1800Ω			
R61	220Ω			
R62	4700Ω			
R63	47K			
R64	33K			
R65	10meg			
R66	33K			
R67	220K			
R68	10K			
R69	10meg			
R70	820K			
R71	220K			
R72	1000Ω			
R73	1.8meg			
R74	22K			
R75	47K			
R76	200Ω 2%	(WW)		
R77	47K			
R78	1.8meg			
R79	820K			
R80	600Ω	2(WW)		

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Grundig Majestic PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	220V ⓐ .25A Tap ⓐ 117V ⓐ .5A	220V ⓐ .075A	6.3V ⓐ 3.2A Tap ⓐ 5V ⓐ .5A	BV9084-018						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Grundig Majestic PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5000Ω Tap ⓐ 2500Ω, 700Ω	4.4Ω Tap ⓐ 1.7Ω	BV9066-050							

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Grundig Majestic PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	5" x 7"	PM		0459-000/21①	57A21	(Arabic numerals may be replaced with Roman Numerals.)
SP2	5" x 7"	PM		0459-000/21①	57A21	① Used in Model 8058 (Part #0459-000/25 or /26 used in Model 8068)
SP3	10½"	PM		7003-002 ②		② Used in Models 8058, 8095 (Alternate Part #7003-003).
SP4	3" x 3"	Electrostatic		7082-002 ③		③ Used in Models 8058, 8068. Four electrostatic speakers used in Models 8095, 8098.
SP5	3" x 3" 7" x12"	Electrostatic		7082-002 ③ 7046-001 ④		④ One in Model 8068, two in Model 8098. (Alternate Part #7046-002.)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Grundig Majestic PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil	9238-038					
L2	FM Ant. Trans.	HFBV1974/I					
L3	RF Choke	HFBV1976/I					2.85 Microhenries
L4	Fil. Choke	9238-012					
L5	RF Choke	HFBV1956/I					Wound on 100Ω resistor
L6	RF Choke	HFBV1976/I					2.85 Microhenries
L7	FM RF Coil	9208-005					
L8	RF Choke	HFBV1975/I	19-1001	BC-562	4604		1.5 Microhenries
L9	FM Osc. Coil	9208-065					
L10	Cathode Choke	HFBV1950/I	19-1000	BC-561	4602		1.25 Microhenries
L11	1st. FM IF Primary	HFBV1977/I					
L12	1st. FM IF Secondary	9208-064					
L13	IF Trap Coil	9208-055					
L14	SW Ant. Trans.	9232-011					
L15	SW Ant. Trans.	9231-016					
L16	BC Ant. Trans.	9208-059					
L17	Loop Stick	9233-007					Part #9233-001 used in 8068 & 8098 Models
L18	SW Osc. Coil	9232-008					
L19	SW Osc. Coil	9231-017					
L20	BC Osc. Coil	HFBV1681					
L21	RF Choke	9238-022	19-1001	BC-562	4604		1.5 Microhenries
L22	2nd. FM IF	7206-208					
L23A B	3rd. FM IF 1st. AM IF	7207-315					
L24	Ratio Det.	7206-207					
L25	2nd. AM IF	7206-108					
L26	3rd. AM IF	7206-105					
L27	RF Choke	HFBV2149/I	19-1000	BC-561	4602		1.2 Microhenries
L28	Tone Choke	9235-003					
L29	Tone Choke	9217-015					
L30	Tone Choke	9217-015					
L31	Speaker Choke	HFBV2028/I					Used in Model 8058
	Speaker Choke	HFBV2048/I					Used in Model 8068
	Speaker Choke	9030-007					Used in Models 8095, 8098
L32	Line Choke	9227-005					
L33	Line Choke	9227-004					

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA Grundig Majestic PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1						

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA Grundig Majestic PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	(78) (LP)	RX-552D RX-552LPD		

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA Grundig Majestic PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M3	.094A	B250C100 ①		60-9150 ①③	D-64 ②	① Selenium Type. ② Silicon Type. ③ Two required.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Grundig Majestic PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4 M5	S/B S/B	0.7A 0.5A 110V	0.7A 110V 0.7A 110/ 220V	101				

MISCELLANEOUS

ITEM No.	PART NAME	Grundig Majestic PART No.	NOTES
M6	Dial Lamp		7V 0.3A
M7	Dial Lamp		7V 0.3A
M8	Lamp		Tone Control Keyboard 6V 0.1A
M9	Lamp		Tone Control Keyboard 6V 0.1A
M10	Lamp		Tone Control Keyboard 6V 0.1A
M11	Lamp		Tone Control Keyboard 6V 0.1A
M12	Lamp		Tone Control Keyboard 6V 0.1A
M13	Lamp		Mushroom Type, 110V 15W (2 used in Model 8095)
M14	Tuning Cap.	1005-022	AM, 2 Gang (Ant. 9-550mmf, Osc. 13-465mmf)
M15	Tuning Cap.	9653-601	FM, 2 Gang
M16	Switch	136/12	Pushbutton
M17	Switch	1024-019	FA Selector
M18	Switch	7410-028	Press button block
M19	Switch	7404-548	Toggle Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	9616-532	Right hand, Large, Lower Part (2 used in Models 8058, 8095)
Knob	9616-536	Small, Top Part (2 used)
Knob	9616-534	Left hand, Large, Lower Part, Models 8068, 8098
Press Button	7404-501	8 used
Cabinet	2047-111	Model 8058
Cabinet	2048-111	Model 8068
Cabinet	2051-111	Model 8095
Cabinet	2052-111	Model 8098
AM Pointer	1035-095	
FM Pointer	1032-073	
Dial Scale	2047-115	Models 8058, 8068, 8098
Dial Scale	2051-115	Model 8095

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

KNIGHT MODEL KN-515 (92SX400)

KNIGHT MODEL
KN-515 (92SX400)

KNIGHT MODEL
KN-515 (92SX400)

TRADE NAME	Knight Model KN-515 (92SX400)
SUPPLIER	Allied Radio Corp., 100N. Western Ave., Chicago 80, Illinois
TYPE SET	AC Operated 8 Channel 15 Watt Audio Amplifier
TUBES (Six)	Types 12AX7/ECC83 AF Amplifier, 12AX7/ECC83 Cath. Follower-AF Amp., 12AX7/ECC83 AF Amp.-Phase Inv., (2) 6BQ5/EL84 Output, 6CA4/EZ81 Rectifier
POWER SUPPLY	105-130 Volts AC-50/60 Cycle RATING .82 Amp. @117 Volts AC (83 Watts)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of H481

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SET 407 FOLDER 12

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	AF Amplifier	12AX7/ECC83
V2	Cath. Follower-AF Amp.	12AX7/ECC83
V3	AF Amp-Phase Inv.	12AX7/ECC83

ITEM No.	USE	TYPE
V4	Output	6BQ5/EL84
V5	Output	6BQ5/EL84
V6	Rectifier	6CA4/EZ81

ELECTROLYTIC CAPACITORS

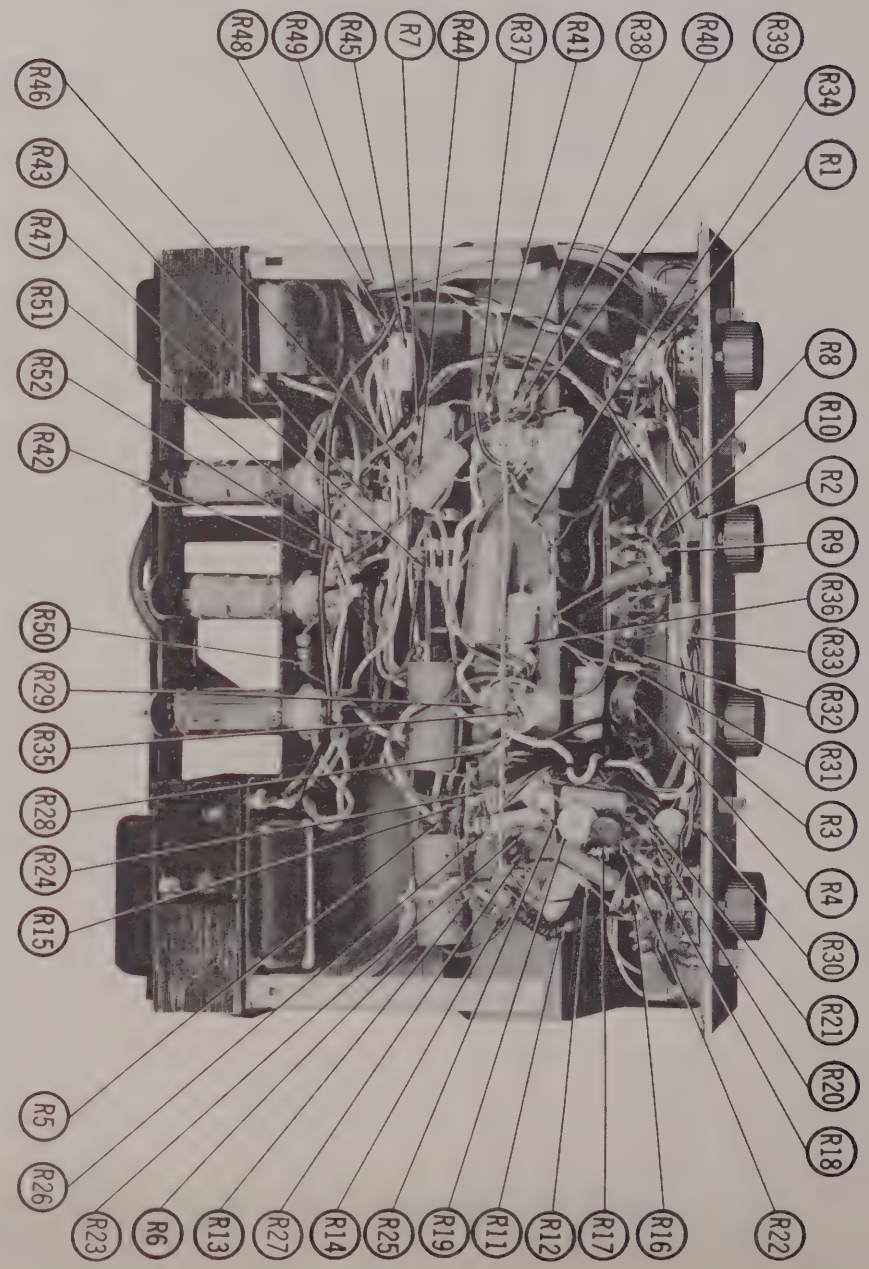
ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▬40	450		AFH4-17	D0160	FP475.5	TMQ-17	Q-055	TVL-4771.3
B	10	450							
C	▲10	450							
D	■ 10	450							
C2	35	50		PRS150V30	BR505	TC47	TD-50-50	MT-0550	TVA-1308
C3	8	450		PRS450V8	BR845	TC71	TD-8-450	MT-4508	TVA-1704
C4	8	450		PRS450V8	BR845	TC71	TD-8-450	MT-4508	TVA-1704
C5	35	50		PRS150V30	BR505	TC47	TD-50-50	MT-0550	TVA-1308

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	100			NP0-DI100	DTZ-100	C10TIC	ZT-531	5TCC-T1	10% NP0
C7	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C8	.01	600		P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C9	270				D6-271	L10T27		MS-327	10%
C10	4700					1R5D47		MS-247	10%
C11	560				D6-561	5R5T56		MS-356	10%
C12	2200					1R5D22		MS-222	10%
C13	1000					1R5D1		MS-21	10%
C14	.022	600		P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C15	.01	600		P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C16	.01	600		P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C17	.1	600		P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C18	.01	600		P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C19	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C20	.0056	200			D6-562				
C21	.056	200							
C22	15			1468-000015	D6-150	5W5Q15	UC-5415	1FM-415	
C23	330				D6-331	L10T33		MS-333	10%
C24	.0033	600		P688N-0033	D6-332	CUB6D33	GEM-6233	6TM-D33	
C25	47			NP0-DI47	DTZ-47	C10Q47C		5TCC-Q47	10% NP0
C26	47			NP0-DI47	DTZ-47	C10Q47C		5TCC-Q47	10% NP0
C27	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C28	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C29	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C30	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	1/2	RP-105AE		AD47-500K-Z	Q13-133		Volume, Tap@50K
B	500K	1/2			Not Req.	M13-133		Volume
C	Shaft				KSS-3	Not Req		
D	Switch				SWE-12	76-1		Power On-Off
R2A	500K	1/2	RP-504AE-D	B-60	A47-500K-Z	Q13-133	U48	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K	1/2	RP-504AE-D	B-60	A47-500K-Z	Q13-133	U48	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4A	500K	1/2	RP-504AE-D	B-60	A47-500K-Z	Q13-133	U48	Tuner Level
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R5A	200Ω	1(WW)	RPW-2011	WN-201	A43-200	WPK200	R250L	Amp.Hum Balance
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R6A	200Ω	1(WW)	RPW-2011	WN-201	A43-200	WPK200	R250L	Mag. Hum Balance
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R7	500Ω	1/2	RP-501D					Damping & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

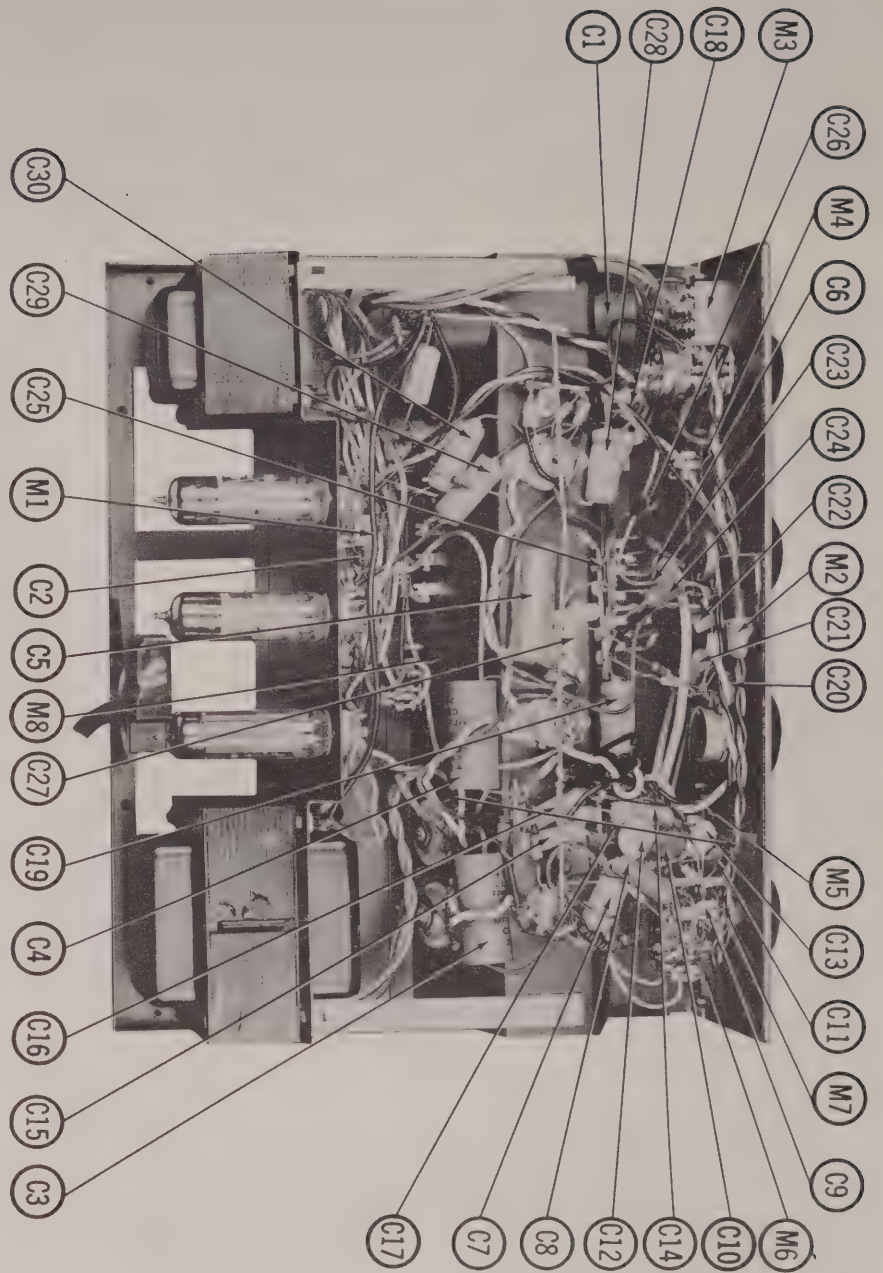
ITEM No.	RATING		KNIGHT PART No.	NOTES
	OHMS	WATT		
R8	18K			
R9	39K			
R10	8200Ω			
R11	100K			
R12	470K			
R13	220K 5%			
R14	1500Ω 5%			
R15	100K 5%			
R16	68K			
R17	330K			
R18	68K			
R19	1meg			
R20	68K			
R21	3300Ω			
R22	100K			
R23	470K			
R24	68K			
R25	4.7meg			
R26	220K 5%			
R27	1500Ω 5%			
R28	22K			
R29	22K			
R30	22K			

ITEM No.	RATING		KNIGHT PART No.	NOTES
	OHMS	WATT		
R31	47K			
R32	4700Ω			
R33	47K			
R34	680K			
R35	220K			
R36	1500Ω			
R37	270K			
R38	470K			
R39	680Ω			
R40	47K			
R41	47K			
R42	220K			
R43	220K			
R44	3000Ω 5%			
R45	1Ω 5%	5(WW)		
R46	39Ω 5%			
R47	430Ω 5%	1		
R48	4700Ω			
R49	4700Ω			
R50	100Ω	1		
R51	150Ω			
R52	10K			

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .82A	500VCT @ .150A Tap@ 15V @ .0015A	12V @ .3A	LP-0262						
	SEC. 3									
	6.3V @3.2A									

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	3000Ω CT	16Ω Tap ⓐ 8Ω 4Ω	L0-0152					22S72 ①		① Use Original Shields

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	KNIGHT PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.0014A		1159	CR-20	Model 12	

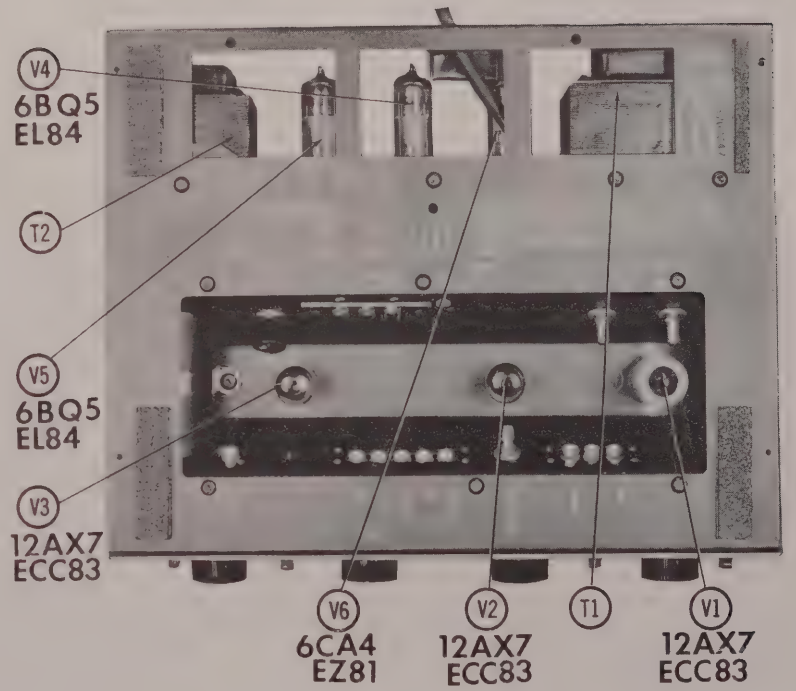
MISCELLANEOUS

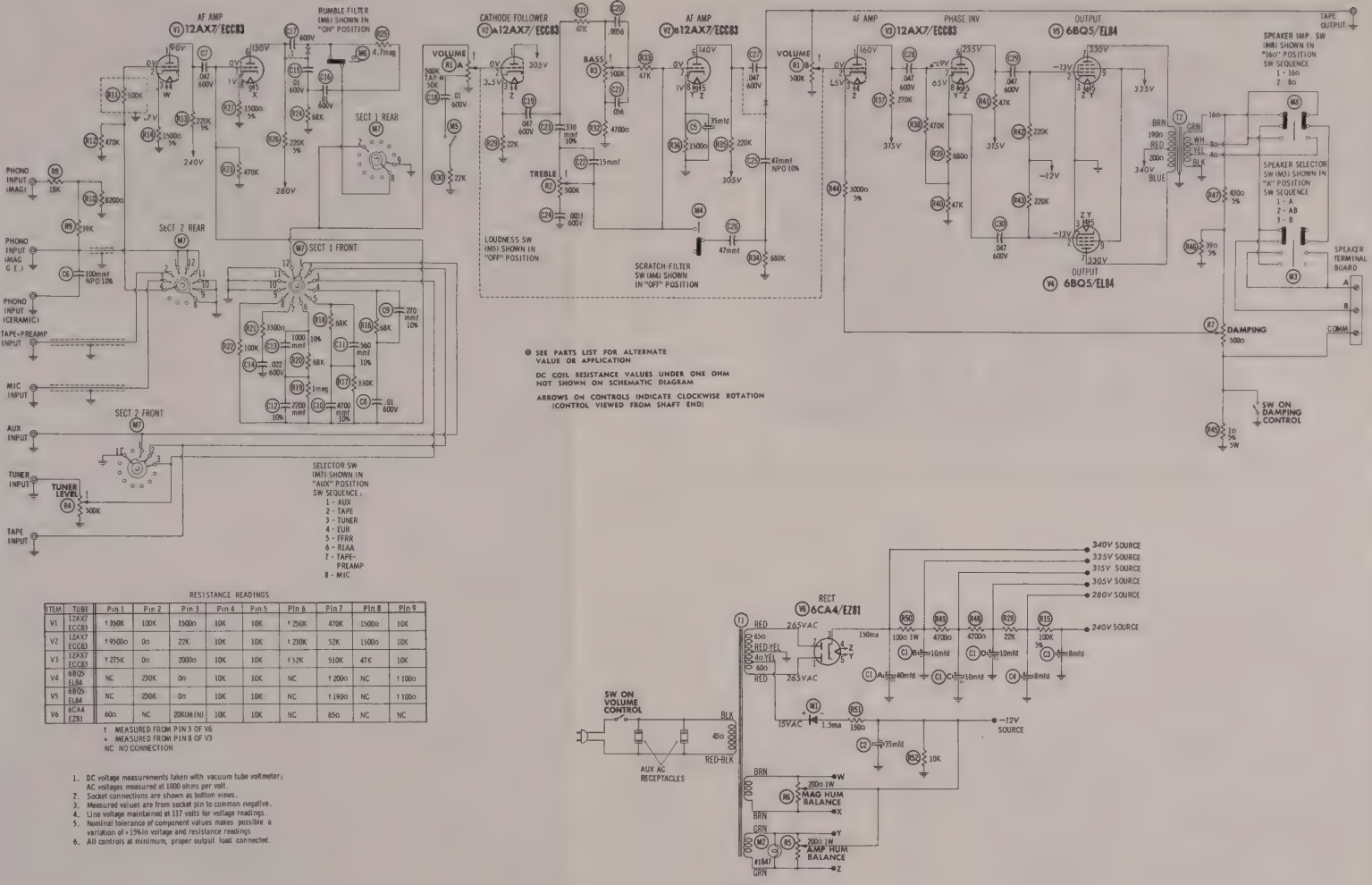
ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M2	Lamp		#1847
M3	Switch		Speaker Selector, 3-Position, Slide Type
M4	Switch		Scratch Filter, 2-Position, Slide Type
M5	Switch		Loudness, 2-Position, Slide Type
M6	Switch		Rumble Filter, 2-Position, Slide Type
M7	Switch		Selector, 8-Position, Dual, Rotary Wafer Type
M8	Switch		Impedance Selector, Slide Type

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7 ECC83	†350K	100K	1500Ω	10K	10K	†250K	470K	1500Ω	10K
V2	12AX7 ECC83	†950Ω	0Ω	22K	10K	10K	†230K	52K	1500Ω	10K
V3	12AX7 ECC83	†275K	0Ω	2000Ω	10K	10K	†52K	510K	47K	10K
V4	6BQ5 EL84	NC	230K	0Ω	10K	10K	NC	†200Ω	NC	†100Ω
V5	6BQ5 EL84	NC	230K	0Ω	10K	10K	NC	†190Ω	NC	†100Ω
V6	6CA4 EZ81	60Ω	NC	20K(MIN)	10K	10K	NC	65Ω	NC	NC

† MEASURED FROM PIN 3 OF V6
* MEASURED FROM PIN 8 OF V3
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected.

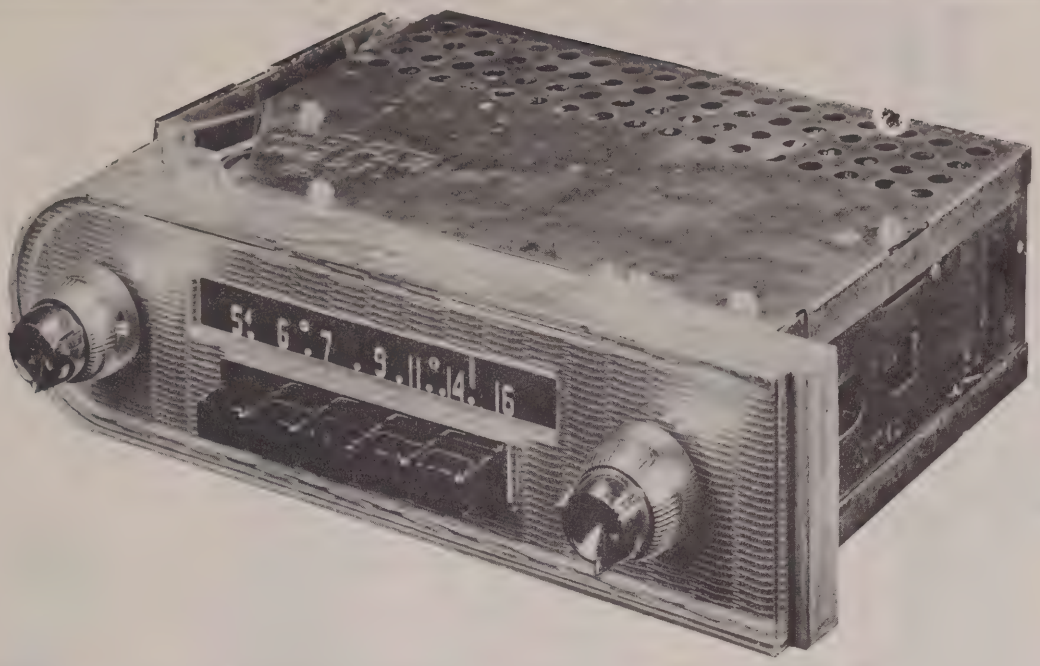
Howard W. Sams & Co., Inc. 1958

PHOTOFACT* Folder

EIA ELECTRONIC INDUSTRIES ASSOCIATION MEMBER

MOPAR MODEL 851

MOPAR MODEL 851



TRADE NAME	Mopar Model 851 (84BC) for 1958 Chrysler Automobiles
MANUFACTURER	Bendix Radio, Div. of Bendix Aviation Corp., Baltimore 4, Maryland
TYPE SET	Battery Operated Custom Built AM Automobile Receiver with Transistorized Output
TUBES (Four)	Types 12CX6 RF Amplifier, 12AD6 Converter, 12CX6 IF Amplifier, 12J8 Det.-AVC-AF Amp.
POWER SUPPLY	12 Volt Storage Battery — RATING 1.2 Amp. @12.6 Volts DC
TUNING RANGE—BROADCAST	530-1605KC

MOPAR MODEL 851

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Set tone control to treble.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 12AD6 (V2) Low side to chassis.	262.5KC (400% Mod.)	High freq. end stop.	DC probe to point (A). Common to chassis.	A1, A2 A3, A4	Adjust for maximum deflection.
2.	Fig. 1	Thru dummy to Ant. receptacle	1605 KC	"	"	A5, A6, A7.	"
	Steps 3 &4 are not necessary unless tuner has been tampered with or associated components have been replaced. Back tuning cores (A8, A9, A10) out of coils but not out of coil forms.						
3.	Fig. 1	Thru dummy to Ant. receptacle.	1605KC	High freq. end stop.	DC probe to point (A). Common to chassis.	A5, A6 A7,	Adjust for maximum deflection.
4.	"	"	1200KC	Tuner carriage .285" from Hi end stop.	"	A8, A9. A10	Adjust for maximum deflection . Repeat Steps 4 & 5.
5.	With radio installed in car and antenna fully extended, tune in a weak station near 1600KC and adjust A7 for maximum.						

PUSHBUTTON ADJUSTMENT

1. Tune manually to desired station .
2. Pull button out, then press in firmly.
3. Repeat for remaining buttons.

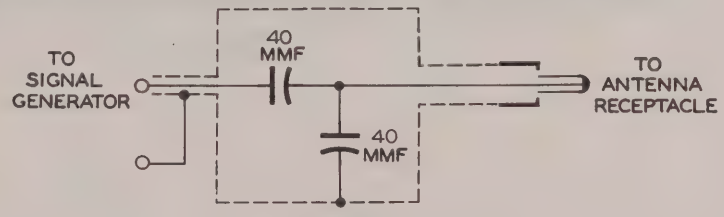


FIG. 1

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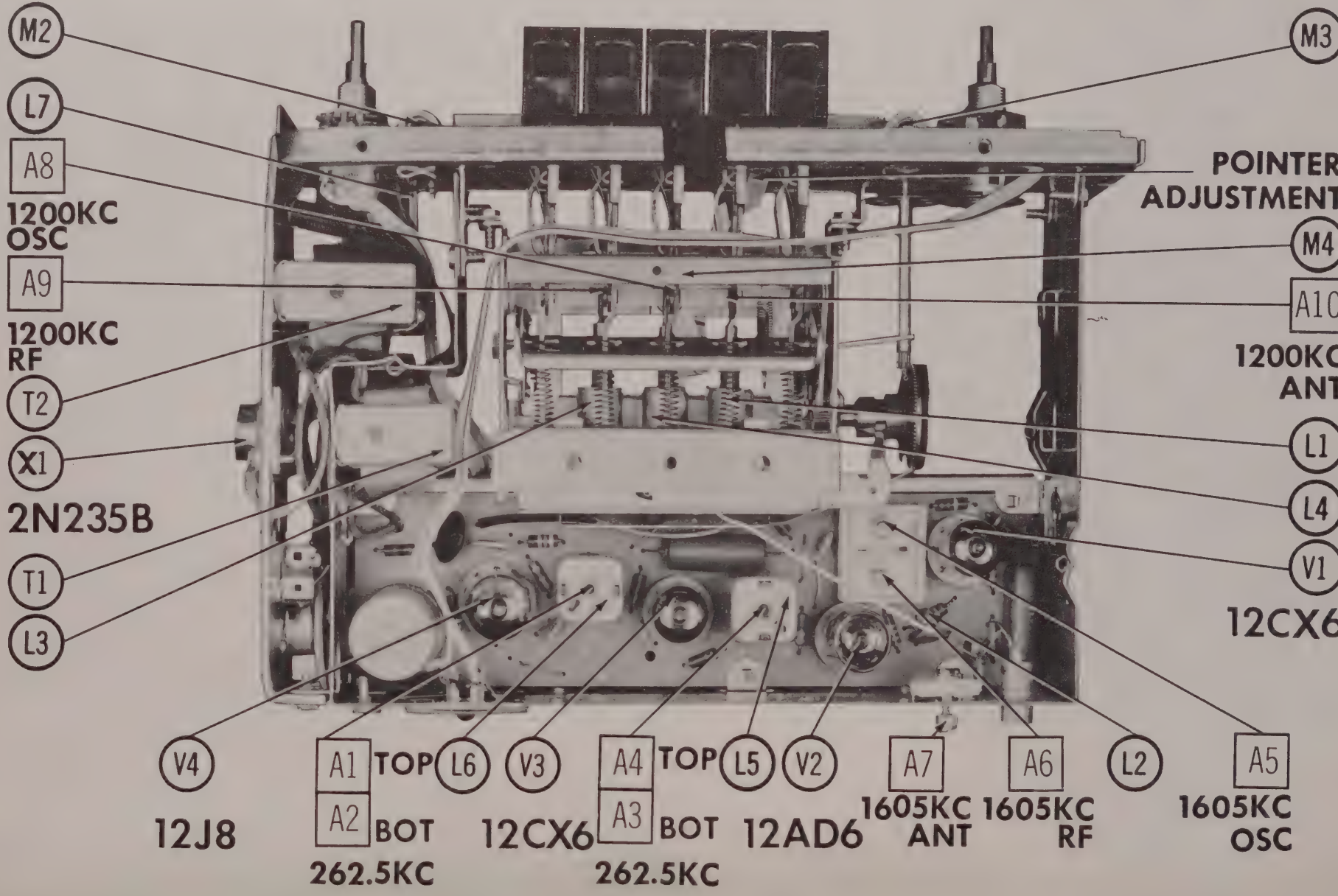
SET 407 FOLDER 13



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12CX6	
V2	Converter	12AD6	
V3	IF Amplifier	12CX6	
V4	Det. -AVC-AF Amp.	12J8	

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N235B	Output				2N235A	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	BENDIX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 800	16	220353-6	AFH2-02-60					R2666 *
B	▲ 250	16							

* Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	BENDIX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	4-75		219083-1						
C3	110		220348-406	1469-00011	TCZ-110	22R5T11		MS-311	5%
C4	22		220332-30	NP0-DI22	DTZ-22	C10Q22C		5TCC-Q22	NP0
C5	.05	100	2090059A-503Y	P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C6	.1	100	2090059A-104Y	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C7	2200		220332-31	BPD-0022	DD-222	BYA10D22	UC-5222		
C8A	120-450								
B	370-445		219092-2						
C	100								
C9	100		220332-14	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C10	68		220332-32		TCL-100				N1500 10%
C11	68		220332-12						N150
C12	22		220332-30	NP0-DI22	DTZ-22	C10Q22C		5TCC-Q22	NP0
C13	2200		220095-47						10%
C14	0027	100			D6-272				Note 1.
C15	10000		220332-21	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C16	300		220267-12						
C17	300		220267-12						

Note 1. Some versions may use 2200mmf (Part # 220095-47)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BENDIX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	L2090616-1	F1-67 ①				Tone
B	1.5meg	½		R2-66				Volume, Tap ⓐ 500K
C	Switch			KB-7 or KR-7*				Power On-Off
R2	30Ω	2(WW)	L2090627-1					Speaker Fader
R3	150-600	2(WW)	0C-219555-14					Transistor Bias

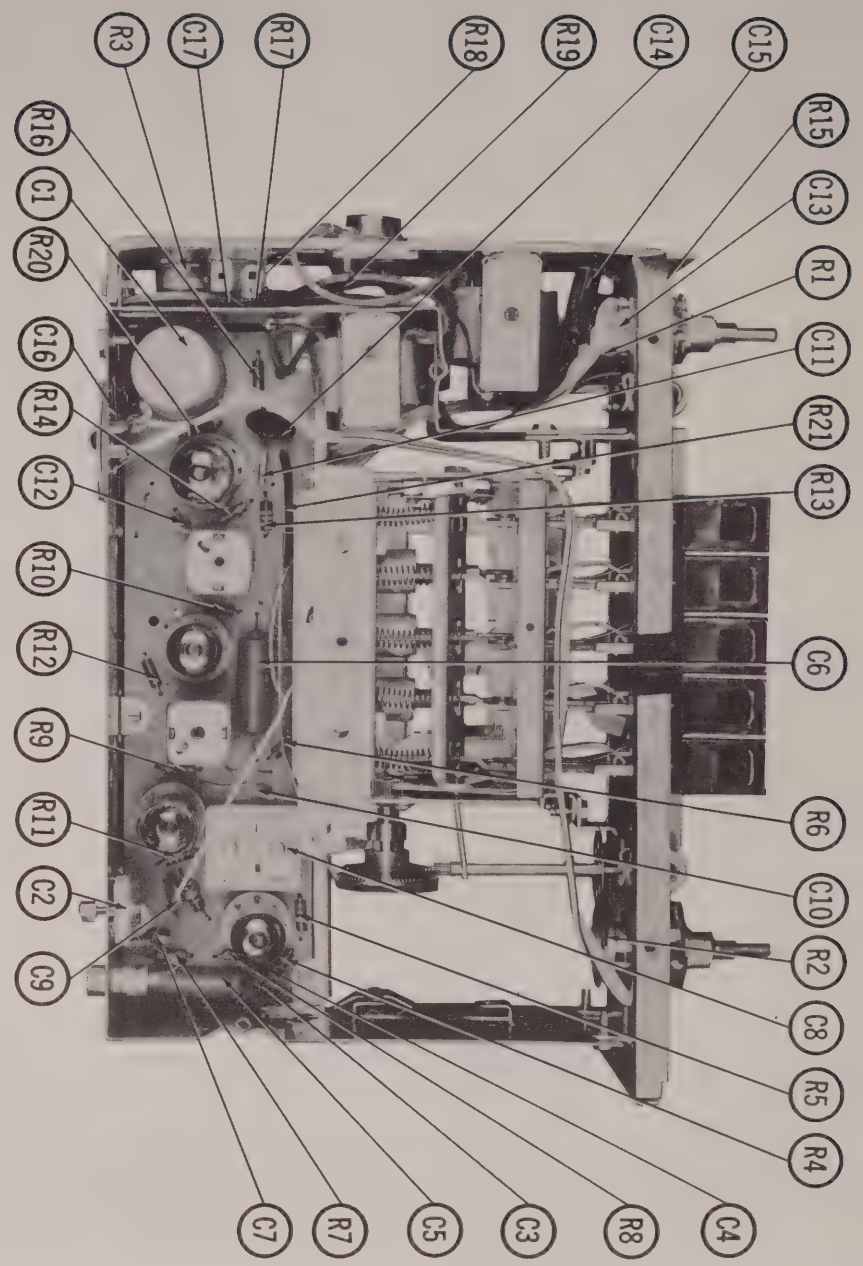
* Use KR with CRL "red label" controls & KB with "blue label" controls.
① Use AK-28 Adaptor Bushing

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		BENDIX PART No.	NOTES
	OHMS	WATT		
R4	680K		220604B-684	
R5	220K		220604B-224	
R6	10meg		220604B-106	
R7	150Ω		220604B-151	
R8	33meg		220604B-336	
R9	33meg		220604B-336	
R10	100Ω		220604B-101	
R11	33K		220604B-333	
R12	2.2meg		220604B-225	
R13	47K		220604B-473	
R14	2.2meg		220604B-225	
R15	100K		220603B-104	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	BENDIX PART No.	NOTES
R16	10meg		220604B-106	
R17	56Ω		220603B-560	
R18			220629-5	Note 1
R19	.5Ω		2090438-10	Note 2
R20	47Ω		220604B-470	
R21	1Ω		2090438-11	Note 3

Note 1. Temperature compensating type.
Note 2. 5.5" cupron wire.
Note 3. 10.5" cupron wire.

TRANSFORMER (INTERSTAGE)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA BENDIX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	5.8	:1	2090700-1							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	REPLACEMENT DATA BENDIX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	22.5Ω Speaker tap @ 3-4Ω	2090648-2							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA BENDIX PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	5" x 7"	PM	3-4Ω	2090642-1 ①	57A21	① Alternate Part #2090744-2

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA BENDIX PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Ant. Coil						Note 1
L2	IF Trap Coil	2090088-1					50 Microhenries; wound on a 18K Resistor.
L3	RF Coil						Note 1
L4	Osc. Coil						Note 1
L5	Input IF	2090513-1	16-6754	BC-320	12-H6		
L6	Output IF	2090549-1					

Note 1. Part of tuner M4.

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA BENDIX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L7	1.2A	.5Ω	.002HY	2090520-5						

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA BENDIX PART No. FUSE	BENDIX PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	SFE	7½A 32V	SFE 7½	221633-9	30707.5 (7AG 7½A 32V)	155009	SFE7½	HDH

MISCELLANEOUS

ITEM No.	PART NAME	BENDIX PART No.	NOTES
M2	Dial Lamp	44	#44
M3	Dial Lamp	44	#44
M4	Tuner Ass'y	2090593-3	Complete
	Printed Board	2090742-1	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

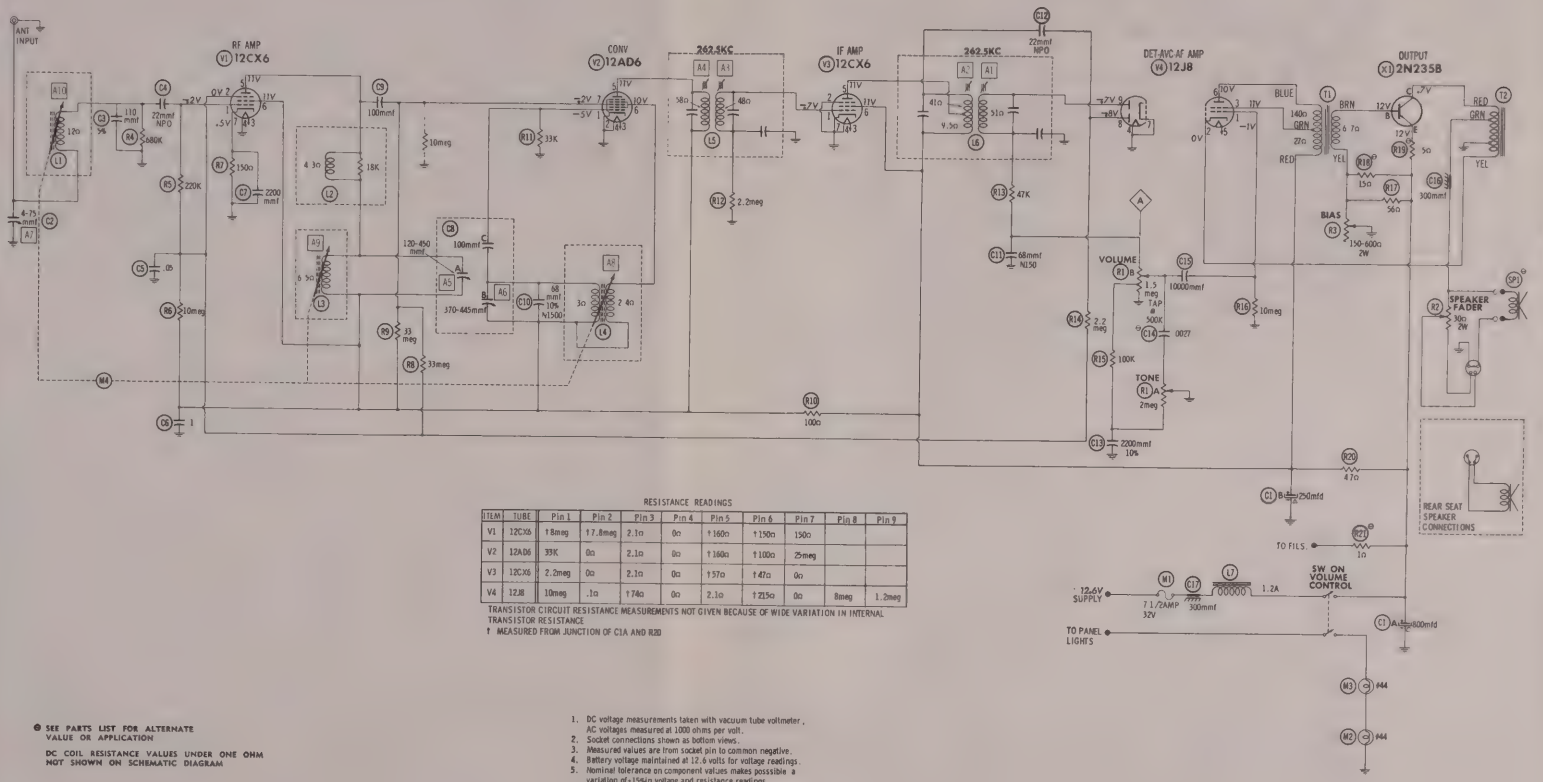
NAME	PART NO.	DESCRIPTION
Bezel	2090709-1	Escutcheon, Dial, Pushbutton
Disc	2090611-1	Tone & Fader
Knob Ass'y	2090610-2	
Pointer Ass'y	2090129-10	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
Use BELDEN No. 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

TRANSISTOR BIAS ADJUSTMENT (R3)

1. Set R3 to its maximum resistance.
2. Connect an accurate low range DC voltmeter from the transistor collector to chassis.
3. Turn on receiver and allow a 15 minute warm up period.
4. Adjust R3 for a meter reading of .60 volts DC. This is equivalent to a collector current of 475MA, the maximum safe value.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12CX6	†8meg	17.8meg	2.1ω	0ω	†160ω	†150ω	150ω		
V2	12AD6	33K	0ω	2.1ω	0ω	†160ω	†100ω	25meg		
V3	12CX6	2.2meg	0ω	2.1ω	0ω	†57ω	†47ω	0ω		
V4	12J8	10meg	.1ω	†74ω	0ω	2.1ω	†215ω	0ω	8meg	1.2meg

TRANSISTOR CIRCUIT RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE
† MEASURED FROM JUNCTION OF C1A AND R20

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

PHOTOFACT* Folder

MOTOROLA MODELS 5T24GW-1, 5T24WN-1, 5T25B-1, 5T25M-1, 5T25MC-1 (Ch. HS-628, HS-629)

MOTOROLA MODELS 5T24GW-1, 5T24WN-1, 5T25B-1, 5T25M-1, 5T25MC-1 (Ch. HS-628, HS-629)

MOTOROLA MODELS 5T24GW-1, 5T24WN-1, 5T25B-1, 5T25M-1, 5T25MC-1 (Ch. HS-628, HS-629)

TRADE NAME	Motorola Models 5T24GW-1, 5T24WN-1 (Ch. HS-628); 5T25B-1, 5T25M-1, 5T25MC-1 (Ch. HS-629)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	AC-DC Operated AM Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC
RATING	.28 Amp. @ 117 Volts AC (25 Watts)
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

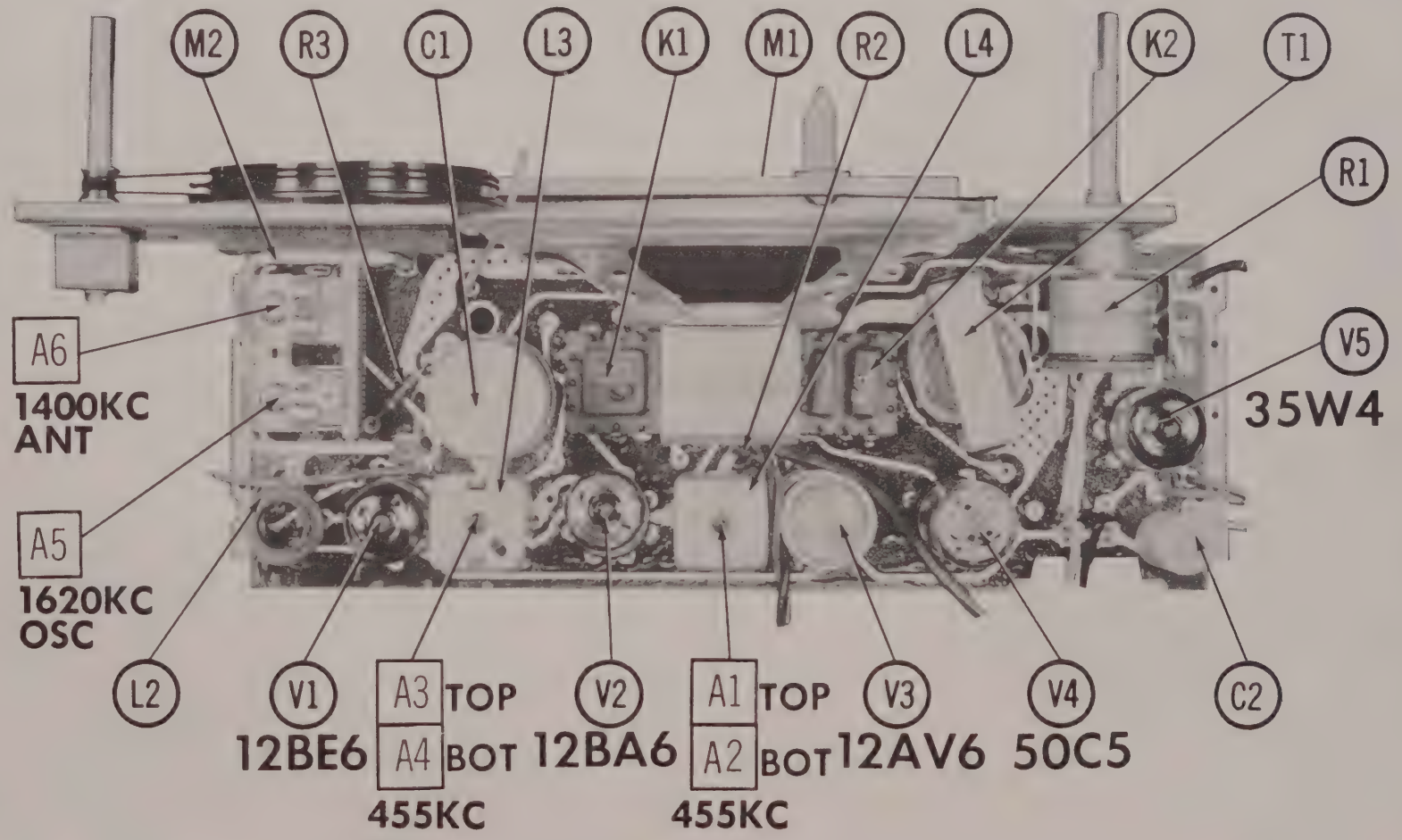
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 12BE6 (V1). Low side to chassis.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"
		Steps 4 and 5 apply to Ch. HS-629 only.					
4.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output with radio installed in cabinet.
5.		"	600KC	Tune to 600KC signal	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output with radio installed in cabinet. Repeat steps 4 and 5.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

H509

SET 407 FOLDER 14



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det.-AVC-AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▪40	150	23B639496	PRS150V4040	BBRT44415	PFP311.63	TDLT-5	FMT-1540	R2644 *
B	▲40	150		40					
C	30	150							

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	400	8K121268	P488N-05	DF-503	BC4S5J	ACE615	4SE-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1meg	½	18B637813					Volume & Switch, Note 1

Note 1. Part #18B638060 (1meg, tap @ 300K) used in Ch. HS-629.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R2	47K		6K121687	
R3	100Ω		6R6326	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω	3-4Ω	25B632025 ①	Z1101 ②	A-3025 ②	AU-605 ②	A-3332 ②	26S58 ②	S-12X ②	① Ch. HS-628. ② Use original channel frame. ③ Ch. HS-629.
	2800Ω	3-4Ω	25B635932 ③	Z1101 ②	A-3025 ②	AU-605 ②	A-3332 ②	26S58 ②	S-12X ②	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	4"	PM	6-8Ω	50K637848 ①	4A1Z6	① Mounts on Ch. HS-628
SP2	4"	PM	6-8Ω	50C637847 ②	4A1Z6.7	② Mounts in cabinet, HS-628
	4"	PM	3-4Ω	50C637922 ③	4A07	③ Used with Ch. HS-629 only.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		MOTOROLA PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loop Stick	24B637855					Ch. HS-628
	Loop Stick	1V638047					Ch. HS-629, Includes cabinet back
L2	Osc. Coil	24B637228					
L3	Input IF	24K636016	16-6780	BC-356	13-PC9	RF-4	
L4	Output IF	24K639362			13-PC6		

CHASSIS—TOP VIEW

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K1	Det.-AVC-AF Amp.	4700mmf, 330mmf, 47000mmf, 330mmf, 8.2meg, 22K, 120Ω, 2.2meg	51C637000	
K2	Audio Coupling	4700mmf, 33000mmf, 22000mmf, 470K, 470K, 150Ω, 1200Ω	51K637001	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1	Lamp	65R125595	#1847
M2	Tuning Cap.	19K639360	Ant. 28-310mmf, Ch. HS-628
	Tuning Cap.	19K639359	Ch. HS-629
	Printed Board	84B637220	

CABINETS & CABINET PARTS

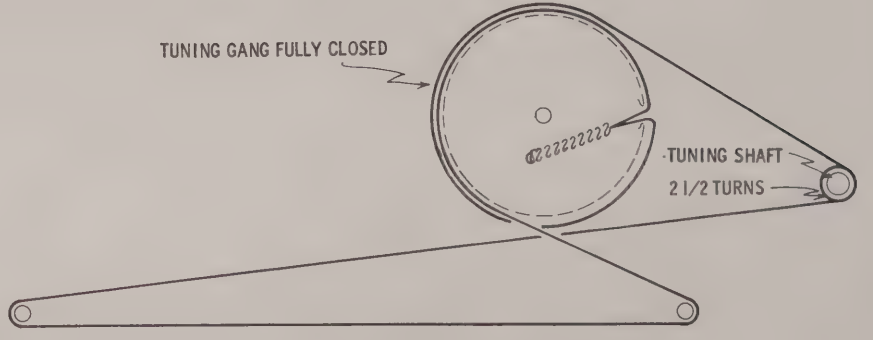
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Bezel	13D637808	5T25-1 Series
Knob	36B637822	Volume & Tuning, 5T24-1 Series, White
Knob	36B638062	Volume & Tuning, 5T25-1 Series, Brown
Cabinet	1V637981	Front Ass'y, Green, Model 5T24GW-1
Cabinet	1V637982	Front Ass'y, Mocha, Model 5T24WN-1
Cabinet	1V637983	Rear Ass'y, White, Model 5T24GW-1
Cabinet	1V638261	Rear Ass'y, Mocha, Model 5T24WN-1
Cabinet	16K637902	Blond Oak, Model 5T25B-1
Cabinet	16E637900	Mahogany, Model 5T25M-1
Cabinet	16K637901	California Mahogany, Model 5T25MC-1
Pointer	52A637824	Ch. HS-628
Pointer	1K638220	Ch. HS-629
Dial Scale	61C637825	5T24-1 Series
Dial Scale	34B637916	5T25-1 Series

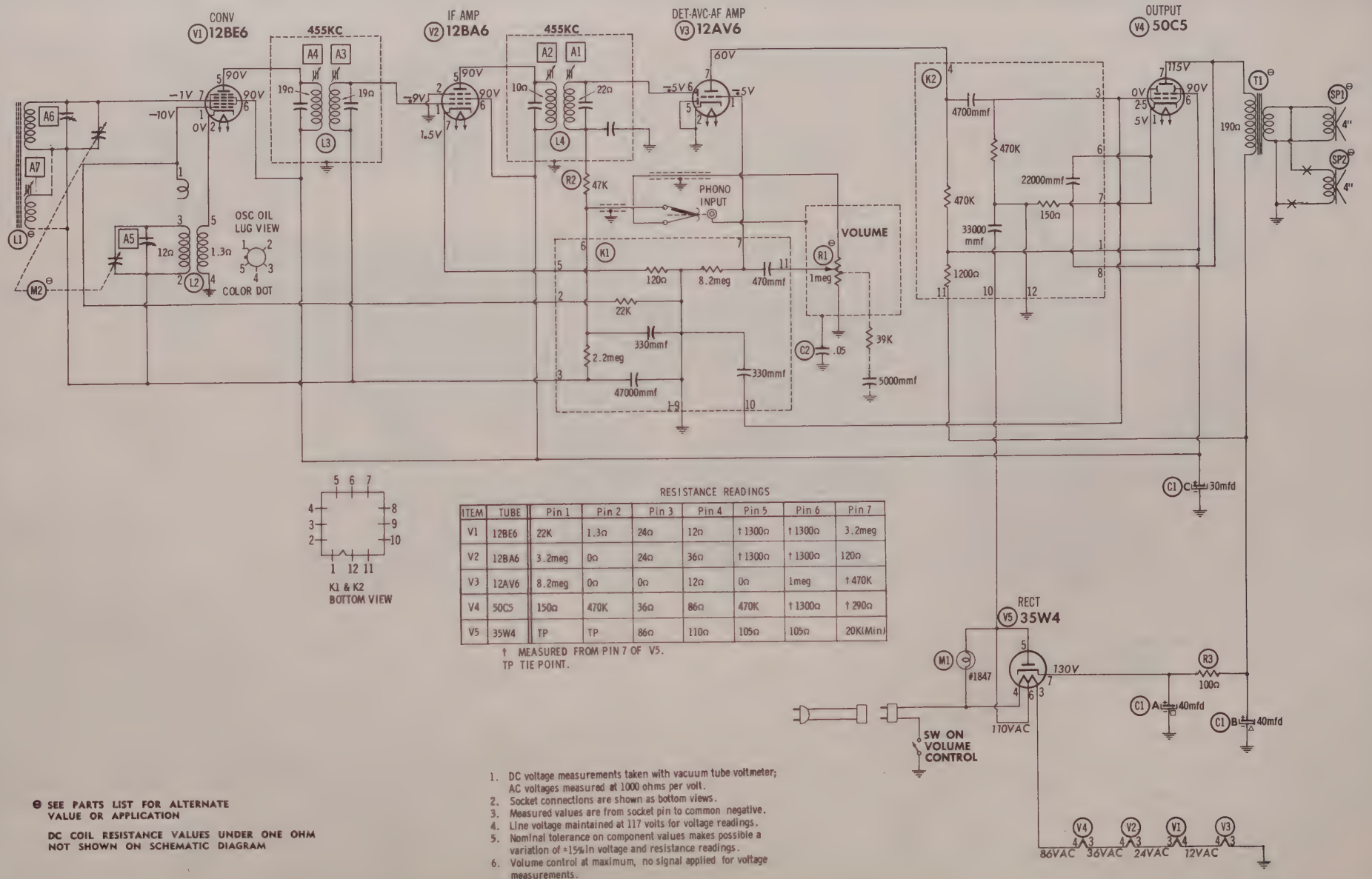
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



DIAL CORD STRINGING



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	1.3Ω	24Ω	12Ω	† 1300Ω	† 1300Ω	3.2meg
V2	12BA6	3.2meg	0Ω	24Ω	36Ω	† 1300Ω	† 1300Ω	120Ω
V3	12AV6	8.2meg	0Ω	0Ω	12Ω	0Ω	1meg	† 470K
V4	50C5	150Ω	470K	36Ω	86Ω	470K	† 1300Ω	† 290Ω
V5	35W4	TP	TP	86Ω	110Ω	105Ω	105Ω	20K(Min)

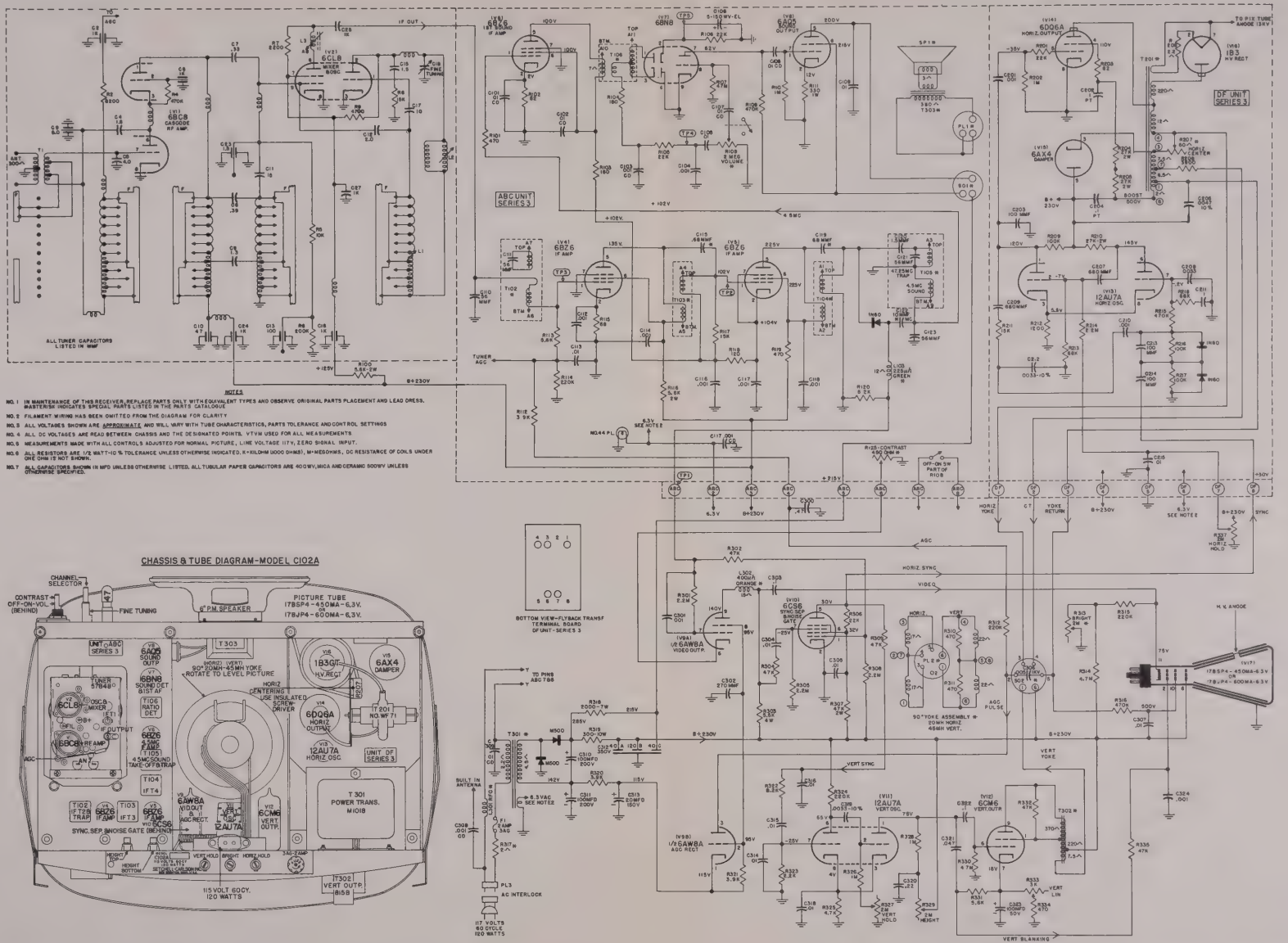
† MEASURED FROM PIN 7 OF V5.
TP TIE POINT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

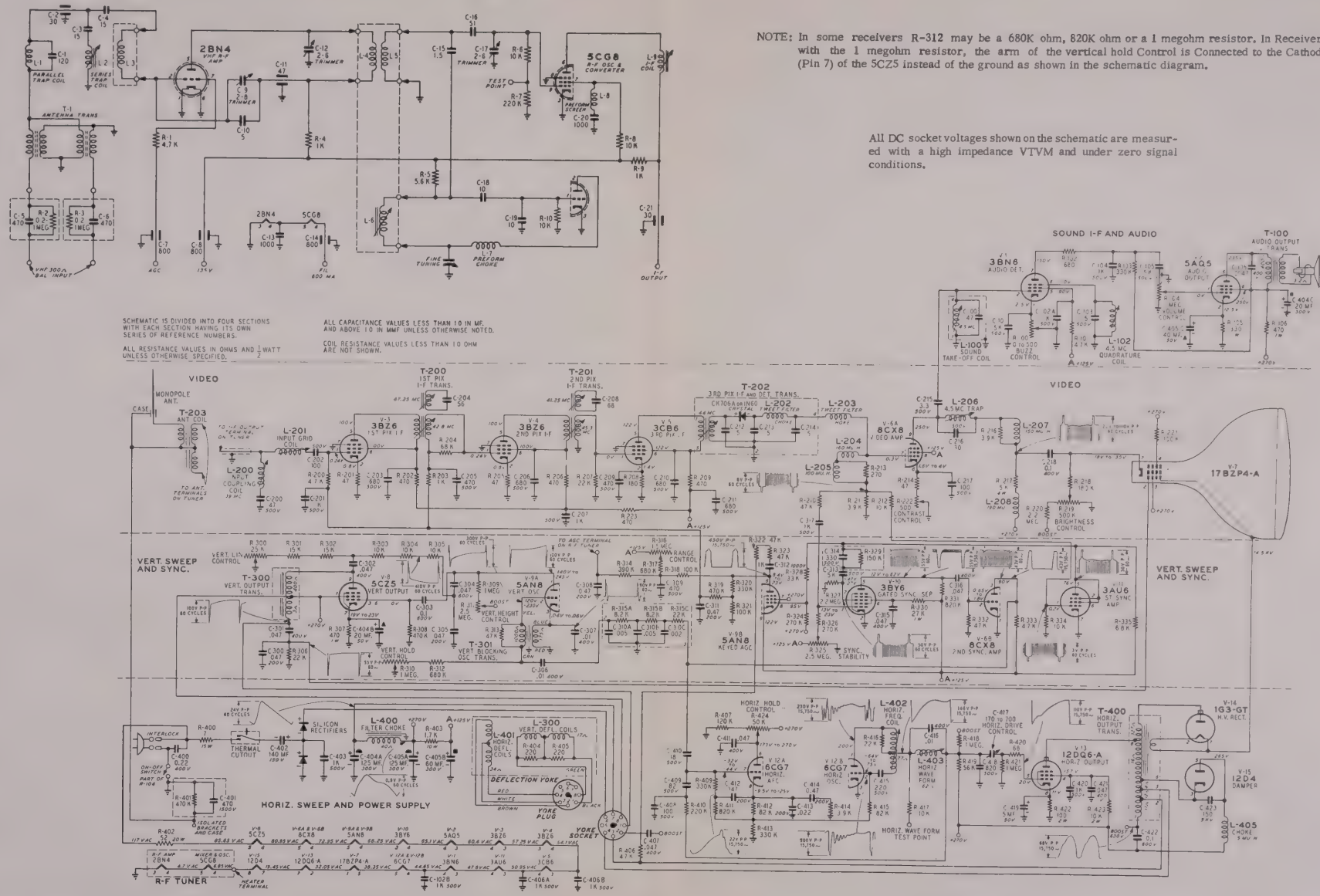
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958


ALL TUNER CAPACITORS LISTED IN MMF
ABC UNIT SERIES 3
DF UNIT SERIES 3
NOTES
NO. 1 IN MAINTENANCE OF THIS RECEIVER, REPLACE PARTS ONLY WITH EQUIVALENT TYPES AND OBSERVE ORIGINAL PARTS PLACEMENT AND LEAD DRESS. ASTERISK (*) INDICATES SPECIAL PARTS LISTED IN THE PARTS CATALOGUE.
NO. 2 FILAMENT WIRING HAS BEEN OMITTED FROM THE DIAGRAM FOR CLARITY.
NO. 3 ALL VOLTAGES SHOWN ARE APPROXIMATE AND WILL VARY WITH TUBE CHARACTERISTICS, PARTS TOLERANCE AND CONTROL SETTINGS.
NO. 4 ALL DC VOLTAGES ARE READ BETWEEN CHASSIS AND THE DESIGNATED POINTS. VTVM USED FOR ALL MEASUREMENTS.
NO. 5 MEASUREMENTS MADE WITH ALL CONTROLS ADJUSTED FOR NORMAL PICTURE, LINE VOLTAGE 117V, ZERO SIGNAL INPUT.
NO. 6 ALL RESISTORS ARE 1/2 WATT ±10 % TOLERANCE UNLESS OTHERWISE INDICATED. K=KILOHM (1000 OHMS), M=MEGOHMS, DC RESISTANCE OF COILS UNDER ONE OHM IS NOT SHOWN.
NO. 7 ALL CAPACITORS SHOWN IN MFD UNLESS OTHERWISE LISTED. ALL TUBULAR PAPER CAPACITORS ARE 400 WV, MICA AND CERAMIC 500 WV UNLESS OTHERWISE SPECIFIED.
CHASSIS & TUBE DIAGRAM-MODEL C102A
CHANNEL SELECTOR
CONTRAST OFF-ON-VOL. (BEHIND)
FINE TUNING
6" P.M. SPEAKER
PICTURE TUBE 17BGP4-450MA-6.3V. OR 17BJP4-600MA-6.3V.
UNIT ABC SERIES 3
T303
90° 20MH 45MH YOKE ROTATE TO LEVEL PICTURE
HORIZ CENTERING USE INSULATED SCREW-DRIVER
T201 NO. WF71
UNIT OF SERIES 3
T 301 POWER TRANS. M1018
SYNC. SEP. NOISE GATE (BEHIND)
VERT HOLD
BRIGHT
HORIZ HOLD
115 VOLT 60CY. 120 WATTS
T302 VERT OUTP. 8158
TUNER 57948
6SC7 MIXER
6BC8 OSC. MIXER
6BC8 R.F. AMP.
6BZ6 I.F. AMP.
6AG5 SOUND OUTP.
6BN8 SOUND DET. & 1ST AF
6AW8A VID. OUT & AGC RECT.
6CM6 VERT. OUTP.
12AU7A HORIZ. OSC.
1B3GT H.V. RECT.
6AX4 DAMPER
6DQ6A HORIZ. OUTPUT
T104 I.F.T.4
T102 I.F.T.2 TRAP
T103 I.F.T.3
T105 4.5MC SOUND TAKE-OFF & TRAP
T 104 I.F.T.4
SEE NOTE 2
SEE NOTE 6
SEE NOTE 5
SEE NOTE 7
SEE NOTE 1
SEE NOTE 3
SEE NOTE 4
TO PIX TUBE ANODE 13KV
M. V. ANODE
90° YOKE ASSEMBLY 20MH HORIZ. 46MH VERT.
HORIZ. SYNC
VERT. SYNC
VIDEO
AGC
VERT. BLANKING
BOTTOM VIEW-FLYBACK TRANSF. TERMINAL BOARD DF UNIT-SERIES 3
BUILT IN ANTENNA
PL3 AC INTERLOCK
117 VOLTS 60 CYCLE 120 WATTS
HORIZ YOKE
CT YOKE RETURN
VERT YOKE
HORIZ HOLD
VERT LIN
VERT HOLD
HEIGHT

SETCHELL-CARLSON MODEL P64 (Ch. C102A)

Schematic Diagram Courtesy of Setchell-Carlson, Inc.



TRUETONE MODEL 2DC3840A

Schematic Diagram Courtesy of Western Auto Supply Co.

The PHOTOFACT Servicer

SET 408 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ AUG. 1, 1958

CONTENTS PHOTOFACT SET 408

TRADE NAME AND MODEL	SET AND FOLDER NO.
TELEVISION RECEIVERS	
DUMONT	
Chassis RA-402, RA-403	408-1
EMERSON	
1282, X, 1283, X, 1284, X, 1285, 1286, 1287 (Ch. 120380H, 381M, 388H, 389M, 412H, HC, 413M, MC, 414H, 437HC, 438MC)	408-2
WELLS-GARDNER	
321N72-A-3730, 321N72-A-3791, 2321N72-A-3732, 2321N72-A-3793	408-3
ZENITH	
A2221R, RU, Y, YU, A2223E, EU, R, RU, Y, YU, A2245E, EU, R, RU, U, A2246E, EU, R, RU, A2252R, RU, A2253E, EU, R, RU, A2282E, EU, R, RU, A2673E, EU, R, RU, A3000E, R, A3001E, R, A3004, E, R, A3006E, H, R, A3007R, A3008E, R, A3009E, H, (Ch. 17A30, Q, U, 17A31Q, 3Z01)	408-4
OTHER EQUIPMENT	
AIRLINE	
GAA-1002, GAA-1007A	408-5
COLLARO Record Changer	
"Conquest" Revised TC-340-E	408-6
FORD	
76MF(SR) (B7A-18805-B1), 86MF (B8A-18805-A)	408-7
GRUNDIG MAJESTIC	
1070, 1088	408-8
HOFFMAN	
B802, M802, SP802, W802, B8002, M8002, SP8002, W8002 (Ch. 1108, 1116)	408-9
KNIGHT	
KN-510 (92SX409)	408-10
MAGNAVOX	
Chassis AMP-171AA	408-11
MOTOROLA	
HK-18B, C, M, W, HK-19, 15KT25B-1, -1S, 15K25M-1, -1S, 15KT25MC-1, -1S, 15KT25MCH-1, -1S (Ch. HS-590, HS-607)	408-12
6H26S-1, -1A, 6H27B-1, -1A, 6H27W-1, -1A, 6K22B-1, -1A, 6K22M-1, -1A, 6K22MC-1, -1A, 6K22W-1, -1A, 15KT24B-1, -1A, 15KT24CW-1, -1A, 15KT24M-1, -1A (Ch. HS-606, HS-619, HS-621)	408-13

The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.

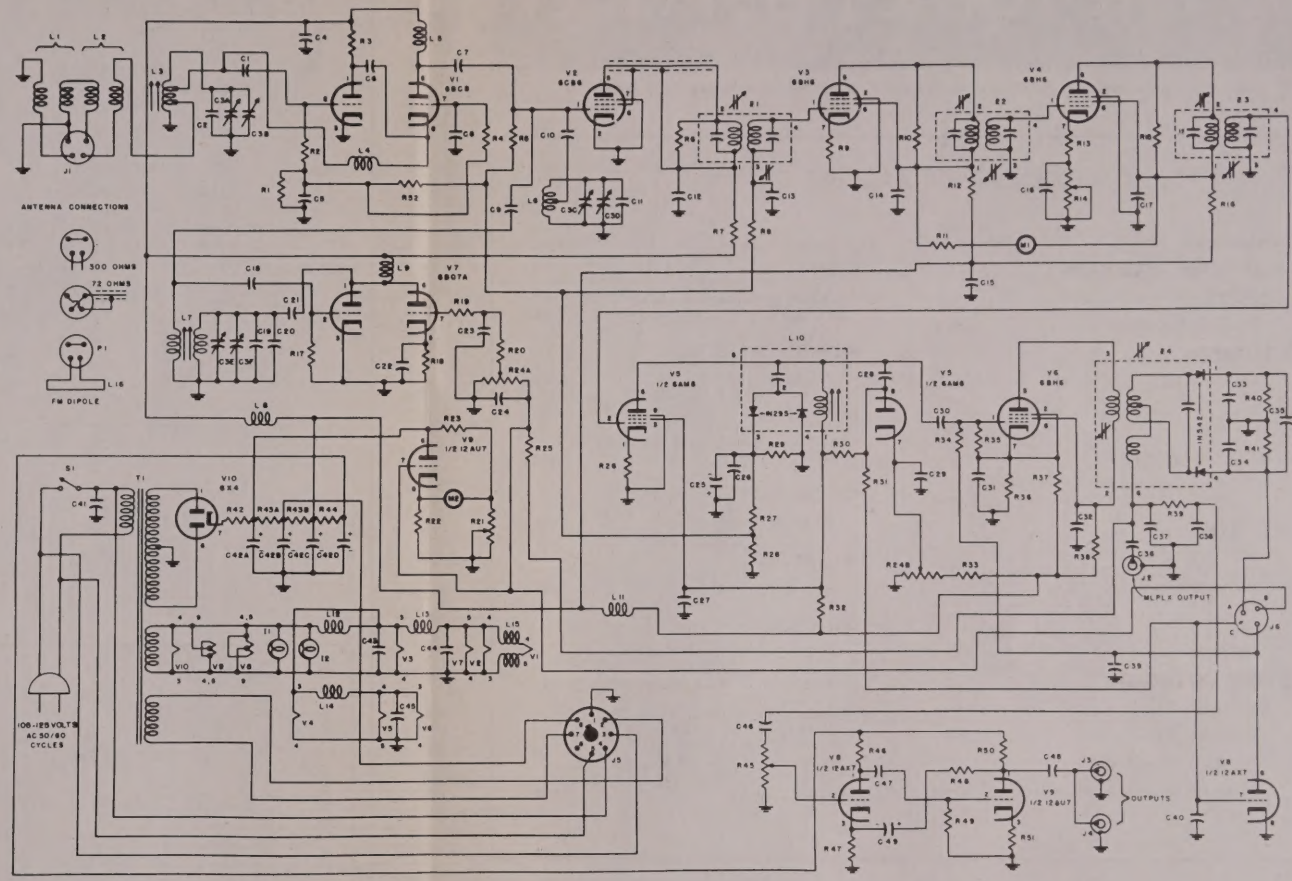
Parts Description List

Symbol	Description	Part No.
C-1, C-28	Capacitor, Ceramic: 100 mmfd; 600 V	C-577-121
C-2	Capacitor, Ceramic: 10 mmfd, NPO; 500 V	CC20CH100G5
C-3A-E	Capacitor, Variable	C-551-119
C-3F	Capacitor, Ceramic trimmer: 1-6 mmfd; NPO	C-520-159
C-4, C-5	Capacitor, Ceramic: .005 mfd: 600 V	CK62GP502V6
C-6, C-21	Capacitor, Ceramic: 500 mmfd; 500 V	C-1315
C-7	Capacitor, Ceramic: 33 mmfd; 500 V	CC21GP330M5
C-8	Capacitor, Ceramic: 470 mmfd; Disc	C-520-143
C-9	Capacitor: 2.2 mmfd	C-3029
C-10	Capacitor, Ceramic: .005 mfd; 600 V	CK62GP502V6
C-11	Capacitor, Ceramic: 5 mmfd, NPO; 500 V	CC20CH050F5
C-12, C-13		
C-14, C-15	Capacitor, Ceramic: .005 mfd; 600 V	CK62GP502V6
C-16, C-17		
C-18	Capacitor, Ceramic: 68 mmfd; disc type	C-551-170
C-19	Capacitor, Ceramic: 5 mmfd ± 1 mmfd N1400; 500 V	CC20VK050F5
C-20	Capacitor, Ceramic: 5 mmfd ± 1 mmfd, N330; 500 V	CC20SK050F5
C-22, C-24	Capacitor, Ceramic: .005 mfd; 600 V	CK62GP502V6
C-23	Capacitor, Ceramic: .05 mfd	C-384-123
C-25	Capacitor, Electrolytic: 10 mfd; 50 V	C-551-146
C-26, C-27	Capacitor, Ceramic: .005 mfd; 600 V	CK62GP502V6
C-29, C-31, C-36	Capacitor, Ceramic: .02 mfd; 600 V	C-556-122
C-30	Capacitor, Ceramic: 33 mmfd; 500 V	CC21GP330M5
C-32, C-40	Capacitor, Ceramic: .005 mfd; 600 V	CK62GP502V6
C-33, C-34	Capacitor, Ceramic: 68 mmfd, 10%; 500 V	CC21GP680K5
C-35	Capacitor, Electrolytic: 10 mfd; 50 V	C-551-128
C-37	Capacitor, Ceramic: 300 mmfd; 500 V	CC21GP301M5
C-38	Capacitor, Ceramic: 1000 mmfd, 10%; 500 V	CC21GP102K5
C-39	Capacitor, Ceramic: .02 mfd; 600 V	C-556-122
C-41	Capacitor, Molded Tubular: .01 mfd; 600 V	C-2747
C-42A, B, C, D	Capacitor, Electrolytic: 40 mfd, 250 V, 40 x 40 x 30 mfd; 290 V	C-550-130
C-43, C-44, C-45	Capacitor, Ceramic: .005 mfd; 600 V	CK62GP502V6
C-46	Capacitor, Ceramic: .047 mfd; 200 V	C6SP473M2
C-47	Capacitor, Ceramic: .0047 mfd; 200 V	C6SP472M2
C-48	Capacitor, Ceramic: .22 mfd; 200 V	C6SP224V2
C-49	Capacitor, Electrolytic: 1 mfd; 250 V	C-540-126
I-1, I-2	Lamp, 2 W	I-563-145
J-1, J-6	Jack	J-520-137
J-2, J-3, J-4	Jack, Phono	J-3143
J-5	Socket, Tube Octal	X-1530
L-1, L-2	Coil, Elevator	L-509-139
L-3	Coil, Antenna	L-551-131
L-4	Coil, Neutralization	L-520-178
L-5, L-8, L-9, L-11	Coil, RF choke, 2.2 micro-henry	L-3352
L-6	Coil, RF	L-551-132
L-7	Coil, Oscillator	L-551-133
L-10	Coil, FM Limiter Assembly	L-551-121
L-12, L-13, L-14	Choke Filament	L-520-156
L-15	Coil, Biflar	L-509-140
L-16	Dipole, Assembly	AS-520-163
M-1	Meter, Signal	M-551-134
M-2	Meter, Tuning	M-551-169
P-1	Plug, 4 male contacts	P-520-138
R-1	Resistor, Composition: 470,000 ohms, 10%; ½ W	RC20BF474K
R-2, R-20	Resistor, Composition: 1 megohm, 10%, ½ W	RC20BF105K
R-3	Resistor, Composition: 470 ohms, 10%; ½ W	RC20BF471K
R-4, R-5	Resistor, Composition: 1 megohm, 10%; ½ W	RC20BF105K
R-6	Resistor, Composition: 33,000 ohms, 10%; ½ W	RC20BF333K
R-7	Resistor, Composition: 1000 ohms, 10%; ½ W	RC20BF102K
R-8, R-25	Resistor, Composition: 470,000 ohms, 10%; ½ W	RC20BF474K
R-9	Resistor, Composition: 100 ohms, 10%; ½ W	RC20BF101K
R-10	Resistor, Composition: 330,000 ohms, 10%; ½ W	RC20BF334K
R-11	Resistor, Composition: 1500 ohms, 10%; ½ W	RC20BF152K
R-12, R-16	Resistor, Composition: 1000 ohms, 10%; ½ W	RC20BF102K
R-13, R-19	Resistor, Composition: 100 ohms, 10%; ½ W	RC20BF101K
R-14	Potentiometer, 250 ohms; wirewound	R-550-135-2
R-15	Resistor, Composition: 330,000 ohms, 10%; ½ W	RC20BF334K
R-17	Resistor, Composition: 4700 ohms, 10%; ½ W	RC20BF472K
R-18, R-22	Resistor, Composition: 1000 ohms, 10%; ½ W	RC20BF102K
R-21	Potentiometer, 1500 ohms; wirewound	R-520-149
R-23	Resistor, Composition: 33,000 ohms, 10%; 1 W	RC30BF333K
R-24 A & B	Potentiometer, Dual with switch	R-551-136
R-26	Resistor, Composition: 220 ohms, 10%; ½ W	RC20BF221K
R-27, R-28	Resistor, Composition: 220,000 ohms, 10%; ½ W	RC20BF224K
R-29	Resistor, Composition: 22,000 ohms, 10%; ½ W	RC20BF223K
R-30	Resistor, Composition: 15 megohms, 10%; ½ W	RC20BF156K
R-31, R-33	Resistor, Composition: 220,000 ohms, 10%; ½ W	RC20BF224K
R-32	Resistor, Composition: 1000 ohms, 10%; ½ W	RC20BF102K
R-34	Resistor, Composition: 100,000 ohms, 10%; ½ W	RC20BF104K
R-35	Resistor, Composition: 470,000 ohms, 10%; ½ W	RC20BF474K
R-36	Resistor, Composition: 4700 ohms, 10%; ½ W	RC20BF472K
R-37, R-50	Resistor, Composition: 47,000 ohms, 10%; ½ W	RC20BF473K
R-38, R-44	Resistor, Composition: 2200 ohms, 10%; ½ W	RC20BF222K
R-39	Resistor, Composition: 68,000 ohms, 10%; ½ W	RC20BF683K
R-40, R-41	Resistor, Composition: 10,000 ohms, 10%; ½ W	RC20BF103K
R-42	Resistor, 220 ohms, 10% 5 W	R-551-137
R-43A, B	Resistor, Wirewound: 910 ohms, tapped at 330 ohms	R-551-138
R-45	Potentiometer, Composition: 500,000 ohms	R-520-139
R-46	Resistor, Composition: 220,000 ohms, 10%; ½ W	RC20BF224K
R-47	Resistor, Composition: 2700 ohms, 10%; ½ W	RC20BF272K
R-48	Resistor, Composition: 33,000 ohms, 10%; ½ W	RC20BF333K
R-49, R-52	Resistor, Composition: 1 megohm, 10%; ½ W	RC20BF105K
R-51	Resistor, Composition: 2200 ohms, 10%; ½ W	RC20BF222K

MISCELLANEOUS PARTS

Dress Panel	AS-551-168
Dress Panel Escutcheon	AS-551-172
Knob, Tuning	E-50049-5
Knob, AFC	E-50049-2
Knob, Muting	E-50049-4
Dial Glass	N-551-117

FISHER MODEL FM-90



SCHEMATIC DIAGRAM COURTESY FISHER RADIO CORP

Resistance Reference Chart

TUBES	SOCKET PINS 1	2	3	4	5	6	7	8	9
V1, 6BC8	20K	2M	0	0	.1	19K	2M	0	0
V2, 6CB6	1M	0	0	.1	20K	20K	0	—	—
V3, 6BH6	560K	100	.1	0	20K	20K	0	—	—
V4, 6BH6	.1	100 350*	.1	0	20K	20K	0	—	—
V5, 6AM8	220	.1	20K	.1	0	20K	6	16M	0
V6, 6BH6	500K	5K	.1	0	20K	20K	5K	0	0
V7, 6BQ7A	20K	4.7K	0	0	.1	20K	1M	1K	0
V8, 12AX7	220K	500K	2.7K	.1	.1	600K	16M	0	0
V9, 12AU7	70K	1M	2.2K	0	0	20K	200K	630	.1
V10, 6X4	90	—	0	.1	—	90	20K	—	—

CAUTION: Be certain to disconnect AC line cord when making these measurements.

NOTES: Muting and AFC Control at maximum, counterclockwise. Level Control maximum, clockwise. All resistance in ohms unless otherwise specified.

M equals Megohms

K equals Kilohms

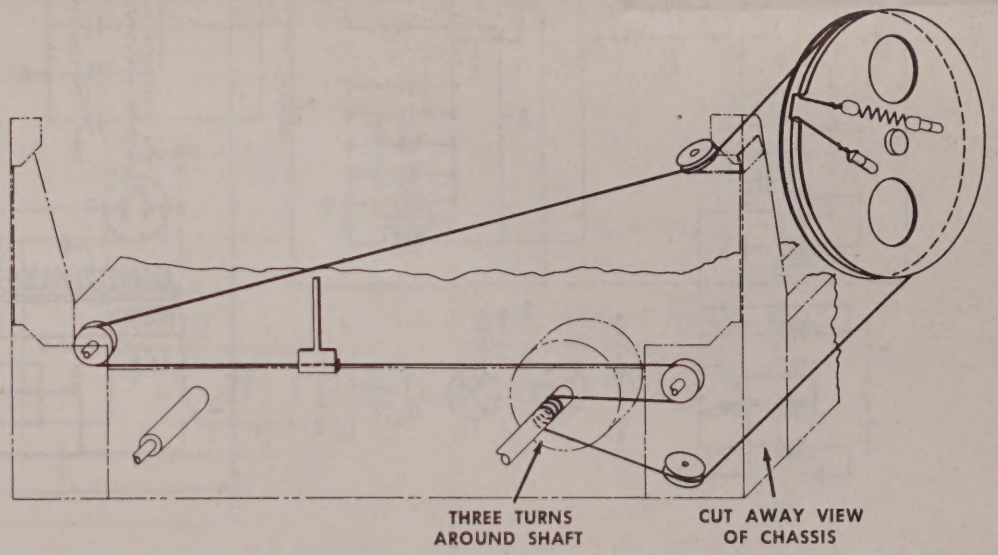
Measurements taken with respect to chassis.

*Varies with the setting of R-14

Voltage Reference Chart

TUBE	SOCKET PINS 1	2	3	4	5	6	7	8	9
V1, 6BC8	102	— .65	0	0	6.3AC	103	— .7	0	0
V2, 6CB6	— 2.5	0	0	6.3AC	100	100	0	—	—
V3, 6BH6	— .43	.46	6.3AC	0	101	101	0	—	—
V4, 6BH6	0	.58	6.3AC	0	100	100	0	—	—
V5, 6AM8	1.8	0	100	6.3AC	0	100	0	— .8	0
V6, 6BH6	23	24.5	6.3AC	0	100	100	24.5	—	—
V7, 6BQ7A	108	— 3.9	0	0	6.3AC	108	0	3.6	0
V8, 12AX7	65	0	.54	6.3AC	6.3AC	26	— .8	0	0
V9, 12AU7	55	0	2.4	0	0	160	0	5.5	6.3AC
V10, 6X4	196AC	—	0	6.3AC	—	196AC	180	—	—

NOTES: Line voltage set at 117 volts, 60 cycles. Voltage readings may vary 10% under normal operating conditions. All voltages read with a vacuum-tube voltmeter under no-signal conditions. Muting Control and AFC Control at maximum, counterclockwise. All voltages read with respect to chassis. Readings are in positive voltages DC unless otherwise specified.



DIAL CORD REPLACEMENT INSTRUCTIONS

1. Remove defective cord and dial pointer.
2. Restring new cord as shown in illustration.
3. Mount dial pointer, and with variable capacitor fully in counterclockwise position, center pointer over index mark at low-frequency end of dial.
4. Wrap dial string with adhesive type tape where string is inserted under pointer tabs.
5. Secure dial pointer in place by applying household cement.

FISHER MODEL FM-90